

104  
THE IMPACT OF HANSCOM AIR FORCE BASE  
UPON SMALL BUSINESS IN THE NEW ENGLAND  
REGION

Y 4. SM 1:104-12

The Impact of Hanscom Air Forces Ba...

HEARING  
BEFORE THE  
SUBCOMMITTEE ON GOVERNMENT PROGRAMS  
OF THE  
COMMITTEE ON SMALL BUSINESS  
HOUSE OF REPRESENTATIVES  
ONE HUNDRED FOURTH CONGRESS  
FIRST SESSION

BEDFORD, MA, FEBRUARY 13, 1995

Printed for the use of the Committee on Small Business

Serial No. 104-12



REPRESENTATION  
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# THE IMPACT OF HANSCOM AIR FORCE BASE UPON SMALL BUSINESS IN THE NEW ENG- LAND REGION

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MONDAY, FEBRUARY 13, 1995

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON GOVERNMENT PROGRAMS,  
COMMITTEE ON SMALL BUSINESS,  
*Washington, DC.*

The subcommittee met, pursuant to notice, at 10 a.m., at the Bedford American Legion, The Great Road, Bedford, Massachusetts, the Honorable Peter G. Torkildsen (chairman of the subcommittee) presiding.

Chairman TORKILDSEN. The Subcommittee on Government Programs of the Small Business Committee will come to order. I would like to thank all the witnesses who are attending and testifying today; also, everyone who has taken time from their schedules to attend this hearing.

I am also most appreciative that later today, Governor Bill Weld will be joining us, as well. State Representative Maryanne Breton has also joined us and we have a number of local officials, including selectmen from the town of Bedford here, as well, and appreciate their attendance.

Just very briefly, the purpose of this hearing is to examine the impact of Hanscom Air Force Base upon local and regional small business. This is not a BRAC hearing. The Small Business Subcommittee on Government Programs has jurisdiction over the Small Business Act and is designed to assist small business in their dealings with Federal Government contracts.

Today's finding will be shared with the Full Small Business Committee. The transcript of today's hearing will also be available for any future use on the importance of Hanscom Air Force Base to the people of New England.

Hanscom has been key in sustaining Massachusetts' economy. Small firms have been a significant beneficiary of Hanscom's presence. The prospect of shutting down entirely should be of great concern to everyone.

We have a number of small business success stories in this room here today. Our panel of witnesses include risk-takers and entrepreneurs who started companies with limited resources. These same individuals now own and manage thriving businesses, which have provided jobs and growth to a region which has faced many economic challenges.



Six years ago, Massachusetts entered a recession. Between 1989 and 1992, the State's economy was particularly hard hit and Massachusetts lost a large percentage of its total jobs, including defense, manufacturing and high tech. However, during the same period, job growth in the small business sector grew. To say that small business would suffer without Hanscom is an enormous understatement. Obviously, the high tech firms that directly contract with Hanscom would be devastated.

But a negative ripple effect would extend much further. For example, many traditional mom-and-pop main street type businesses, including family owned restaurants, convenience stores, dry cleaners, flower shops, all the support businesses that any economy includes in its economic base, would be adversely affected. Such entities rely on Hanscom's direct and indirect work force.

However, Hanscom's importance cannot merely be assessed on an economic basis. Hanscom is, first and foremost, critical to our national security. It has been credibly said that the war in the desert of the Persian Gulf was won in the laboratories of Hanscom. Electronic Systems Center innovations made it possible for allied commanders to apply smart weapons with deadly accuracy against the enemy, severely curtailing the cost of operations in terms of American lives, most importantly, and also dollars.

The results were simply phenomenal. During the past 30 years, the Air Force has systematically assembled its finest brain power at Hanscom, forming a synergistic research and development complex which ties together many contributing elements. The Electronic Systems Center is supported by diversified R&D components, including Mitre Corporation, Lincoln Laboratory, and the Phillips Laboratory Geophysics Directorate.

These entities, in turn, worked directly with an array of prestigious academic institutions, including the University of Massachusetts, Harvard University, MIT, Boston University, Northeastern University, and others. Supporting this is a large number of private companies whose contributions to research and product development have made this area famous around the world.

The economic impact of Hanscom Air Force Base is staggering. The installation is the fourth largest employer in Massachusetts, with 11,500 direct jobs and another 19,800 indirect jobs. The direct payroll alone is \$653 million annually. Approximately \$600 million per year flows from Hanscom to local universities and nonprofit research centers, with another \$400 million paid annually for the services of local companies.

The total impact on the New England economy is a very significant \$3.2 billion per year. I would like to commend the Team Hanscom representatives who have been relentless in their efforts to educate the citizens of New England and the decisionmakers in the Pentagon regarding the importance of Hanscom Air Force Base.

[Chairman Torkildsen's statement may be found in the appendix.]

Chairman TORKILDSEN. I will now yield to my friend and colleague from Massachusetts, Congressman Marty Meehan, the Ranking Minority Member of the Small Business Subcommittee on Tax and Finance, for any comments he may wish to make at this time.



Mr. MEEHAN. Thank you very much, Congressman Torkildsen. Let me first of all say that Congressman Torkildsen and I were elected 2 years ago to the 103rd Congress and worked effectively on a number of issues in the Small Business Committee, as well as on a new manufacturing task force which was established in the last Congress to look at those issues that affect manufacturing in America. I thank Congressman Torkildsen for his efforts in that task force, as well.

I do have to tell you, Congressman, that in my wildest dreams did I never anticipate that just 2 years later, after our election, I would be sitting at a hearing and I would be calling you Mr. Chairman. You never know.

But I am pleased to be here and want to congratulate you on this hearing. Mr. Chairman, I am pleased to join with you and, later, Governor Weld and other Members of the Congressional delegation and members of the State legislature, to discuss the importance of the small business community to the mission at Hanscom Air Force Base.

In Massachusetts, small businesses make up over 98 percent of business firms statewide. Only 50 percent of private non-farm workers in the Commonwealth are employed by small business. Clearly, small businesses drive the engine of the Massachusetts economy.

As we learned last week when the Secretary of the Air Force visited the base, Hanscom Electronic Systems Command is one of the crown jewels of the Air Force. It is a world class acquisition and development center for command, control, communications and intelligence systems. As a developer and purchaser of electronics and computer technology for the Air Force, Hanscom must always be on the cutting edge of innovative developments.

The small businesses who have contracts with the base ensure a replenishing pool of highly skilled technical talent to meet the unique technology mission of the base. As we all know, some of the best laboratories for high technology advances are our Nation's small businesses. The Commonwealth of Massachusetts, the high tech businesses located along Massachusetts' version of the Silicon Valley, Route 128, are principally small businesses who underpin and support the Hanscom mission and drive the engine of the Massachusetts economy.

The economic import of Hanscom in the New England economy was \$3.2 billion. This investment represents literally thousands of local jobs and the majority of these are small businesses in the region. Hanscom provides \$120 million a year to the regional small business community. While many of these contracts are Defense-related, it is important to note that the high technology mission at Hanscom has spawned the growth of related industries, like software engineering companies, sophisticated x-ray technology systems and systems integration.

Companies like the ones that we will be hearing from this morning all have one thing in common—that entrepreneurial spirit that enabled them to grow their business base around Hanscom Air Force Base.

I am pleased, Mr. Chairman, that you have put together this hearing and commend you for the selection of witnesses. They rep-

resent an interesting cross-section of small businesses that depend on Hanscom and that Hanscom is dependent upon for continued growth.

As we said at the hearing that we had recently relative to Hanscom, the small businesses that surround Hanscom Air Force Base are developing the leading high tech technology that is important to the national security of the United States. Congressman Torkildsen, Mr. Chairman, you serve on the National Security Committee and are well aware of the role that these small companies are playing in the national security of the United States and the important role that they are playing for the Air Force.

Much of the leading edge technology that we will need in the future defense of the United States is dependent upon those small companies around Hanscom Air Force Base.

So, I am delighted to be here to join with you and our colleague, Congressman Kennedy, for these hearings. Thank you, Mr. Chairman.

Chairman TORKILDSEN. Thank you, Congressman Meehan. Now I'd like to turn it over to Congressman Kennedy, if you have any comments you wish to make.

Mr. KENNEDY. Thank you, Mr. Chairman. Marty, good to see you. I want to welcome our witnesses and all of those who are interested in the process of keeping open Hanscom Air Force Base.

I was trying to figure out exactly why Peter Torkildsen wanted to invite me. The first month I was elected, actually in the fall campaign of 1986, I picked up a Newsweek magazine and there was a statement from then Secretary of Defense Casper Weinberger, who was saying that he wanted to make the Watertown Arsenal the first base in the country that was going to be shut down under the Base Closure Act. Somebody said, "Well, why do you want to do that?" And he said "because Tip O'Neill has never once voted for his defense budget, and so why the hell should we keep his base open?"

So, the problem was that, of course, Tip left office that year and I then became the Congressman from the 8th District. Within about a month of the time I took over, my base was closed. So, the fact is that, as everybody here knows, this is a process that means business and it only, I think, works if the community comes together in a way that the people here in Massachusetts have really come together behind keeping open Hanscom Air Force Base.

This is a really unique situation and one that is very different than many that we've seen around the country in that the work of Hanscom and Lincoln and so many of the other organizations that are associated with Hanscom cannot be duplicated in any other circumstance throughout the United States.

There are many situations and I think all of us that want to see the defense budget come more in line with the threats that face our country coming into the 21st Century and have advocated, in fact, in cases for a smaller defense budget, also have to recognize that we need to keep this country strong. We need to deal with the real threats that face the United States of America and, in so doing, we have to do it with the most cost-effective approach possible.

If we look at what is cost-effective, it simply doesn't make sense to close Hanscom Air Force Base. You've got a unique situation

that involves some of the finest universities, some of the finest companies, some of the most advanced technology of any situation in the entire world that all comes together right here at Hanscom.

The tremendous number of jobs and impact that it has is, while very, very important, also is something that the Base Closing Commission hears from many other communities throughout the country. So, that isn't going to, in and of itself, make it unique. What makes it unique is the tremendous amount of synergy that can take place between the universities, between the businesses and between those that work in the small business community at Hanscom Field.

So, we want to just more or less this morning take the opportunity to listen to our fine witnesses, to hear directly from you as to what your feelings are about the rationale for keeping the base open. This is an important issue to our Congressional delegation. We've had many, many meetings about it in Washington and will continue to.

The one advantage about continuing to have the President of the United States on your team is that even with Peter Torkildsen wants to hear from him every once in a while, Marty and I can help. So, anyway, we're looking forward to hearing from all of you and look forward to a good hearing and keeping this base open.

Thank you very much, Mr. Chairman.

Chairman TORKILDSEN. Thank you, Congressman Kennedy. Yes, as Congressman Kennedy alluded to, bipartisanship is the order of the day and the Massachusetts delegation I think is demonstrating the need for that now.

Mr. KENNEDY. Mr. Chairman, can I just insert my official statement for the record?

Chairman TORKILDSEN. Yes. Without objection, Congressman Kennedy's statement will be submitted for the record.

[The information may be found in the appendix.]

Chairman TORKILDSEN. Also, without objection, Congressman Barney Frank has submitted a statement and that will be included in the record at this point, as well.

[The information may be found in the appendix.]

Chairman TORKILDSEN. Our first panel is comprised of individuals from Hanscom Air Force Base. We have Colonel Ken Collins, Captain Shannon Sullivan, and Mr. Al Hart, who will be testifying today.

Colonel Collins is director of Quality Initiatives and Strategic Planning in Hanscom's Electronic Systems Center. He is responsible for establishing the approach and assessing the deployment of quality activities across the 10,500-person center. He also directs the center-wide strategic planning activities.

Captain Sullivan is a member of Team 21, which supports the BRAC process by providing installation data through the DOD structure.

Mr. Al Hart is the Director of the Small Business Office at Hanscom's Electronic Systems Center.

Gentlemen, thank you for appearing today. I would ask all of you to summarize your written statements. Your written statements will appear as written in the record. If you could summarize them



for us, then we'll proceed to questions. But, please, proceed, Colonel Collins.

**TESTIMONY OF COLONEL KEN COLLINS, DIRECTOR, QUALITY INITIATIVES AND STRATEGIC PLANNING, ELECTRONIC SYSTEMS CENTER, HANSCOM AIR FORCE BASE**

Colonel COLLINS. Good morning. I'm Colonel Ken Collins, director of Quality Initiatives and Strategic Planning, as you said, at Electronic Systems Center at Hanscom.

My presence before you is twofold this morning. First, I am acting as the command representative and assure you that the Electronic Systems Center and Hanscom are committed to working with small businesses in the region. As you will hear in our presentation, we find our interaction with small business to be advantageous not only in the economic impact on the area, but also to our command the Air Force in the production of the world's finest command, control, communications, computing, and intelligence systems.

Second, I want to introduce the gentlemen who will provide you with the facts on Hanscom and small businesses, Captain Shannon Sullivan, who is Chief of the Special Projects Office. He will make a presentation and then Mr. Al Hart, of our Small Business Office, is available to answer your questions.

Now I will turn it over to Captain Sullivan.

[Mr. Collins' statement may be found in the appendix.]

**TESTIMONY OF CAPTAIN SHANNON SULLIVAN, TEAM 21, HANSCOM AIR FORCE BASE**

Captain SULLIVAN. Thank you, sir. Thank you, Mr. Chairman. Good morning, Congressman Meehan, my congressman, thank you, Congressman Kennedy. My name is Captain Shannon Sullivan, again. We've said that enough times. I'm here to talk about—I'm from the Special Projects Office. I'm here today to talk about Hanscom's impact and reliance on small business.

The figures I will be discussing cover current prime contracts to small business. They do not take into account the several billions of dollars of secondary spending created by the base, nor will they address money paid to small business through subcontracting with large business in support of the base.

To give adequate justice to the value of our small business contracts, I must first describe the major work that's conducted at Hanscom Air Force Base. Our mission is called C4I, Command, Control, Communications, Computers and Intelligence. We've seen the effects on business of the information superhighway and that impact is even more dramatic when in the military because the side that can obtain and control information will have an enormous advantage over any adversary.

How does this relate to Massachusetts' small business? In an age where computing power leaps a generation every 18 months, it is essential to be immersed in an environment that has the latest products and the brightest minds. Massachusetts' small business is a critical ingredient of that environment.

Today I will cover briefly Hanscom's small business awards, our small business contracts, the team we have established within the community, and, finally, a conclusion.

Hanscom is an acknowledged leader in small business procurement, as these awards will attest. We've been awarded the Secretary of the Air Force Small Business Award 8 of the past 10 years for consistently exceeding the goals set by the Department of Defense. In 1993, we were awarded the Small Business Excellence Award for having the very best small business program in the Air Force. We have exceeded the congressionally mandated 5 percent goal of contracts to disadvantaged business five times in the past 6 years.

To give you an idea of who we contract with, here is a list of the major categories our contractors fall under. They are engineering services, intelligence systems, C4I systems integration, research and development, construction, small purchases, physical security systems, travel services, and base maintenance.

To get a rough notion of how the contract dollars are distributed, we can apply the estimated contract values and percentages across these categories. As you can see, the majority of contracts are in support of program development efforts.

Now, let's get a closer look at how the obligations are spent from year to year. These are the total small business obligations for Hanscom over the past 4 years. They cover all of our dealings with small business, not just in Massachusetts, and, in all, they make up 10 to 15 percent of the obligations to profit-seeking companies.

When we break out the small disadvantaged obligations, you can see that a large percentage of our small business contracts go to disadvantaged firms.

The next step is to break out the top 10 small business contracts. As you can see, Infotech leads the group, with over \$33 million. The asterisk indicates a small disadvantaged business. To get a better feel of the Massachusetts impact, we can denote those companies that are based in Massachusetts in red. We can add those companies, also in red, that are based elsewhere, but work in Massachusetts. The remainder are those that conduct their business out of State.

Many people think that small business role in defense procurement is confined to base maintenance and small purchases. This list clearly refutes that notion. All of these companies are integrating intelligence systems, assisting in engineering support, or producing physical security systems.

Electronic Systems Center has had many hugely successful programs and much of the credit has to go to our small business partners. That partnership must begin at the top. Our Commander, Lieutenant General Charles E. Franklin, is committed to utilizing small business to its fullest. A supportive environment has been established within the program offices and laboratories to encourage small business participation. It has truly become an integral part of our research and development efforts.

We are always open to looking at new ways to use small business within the programs and to encourage their use by large contractors. Our Small Business Office, who has won so many accolades, continues to foster small business. They are a central one-stop-

shopping location to encourage small business access to Hanscom and its programs. They perform functions like helping over 2,500 callers and visitors each year, bringing large contractors across the U.S. to meet with small business at Subcontracting Opportunities Day, and assisting in the adjustment and integration of small contractors into the mainstream of ESC Programs.

But it's a two-way street. We also reap great benefits through encouraging small business. I've already alluded to our dependence on staying abreast of the latest technologies and products. We also find contractors to be very responsive and focused on the task at hand. They increase the competition within the high tech community and offer the lowest prices through lower overhead rates.

Finally, by providing opportunity to small business, we feel we are encouraging the brightest minds to start new companies and stress new technologies.

The Electronic Systems Center mission of C4I is vital to the defense of the United States. To keep our edge in this rapidly evolving field, it is essential that we are closely linked with the latest technologies and products. Massachusetts' small business plays an integral role in providing us with the technical expertise and services to complete our mission. Small business also provides that backbone support to keep the base and its facilities running smoothly.

Electronic Systems Center's contribution to the Department of Defense is not bombs, bullets, tanks or planes. It's contributions come in the form of innovative, highly educated people, working together as a team to produce state-of-the-art electronic systems. A major member of that team is small business.

That concludes my briefing. Are there any questions?

[Mr. Sullivan's statement may be found in the appendix.]

Chairman TORKILDSEN. Thank you very much, Captain. Mr. Hart, did you have a prepared statement you wished to make?

Mr. HART. No, I do not.

Chairman TORKILDSEN. Thank you. Then we will proceed to questions. Captain, thank you very much for that very informative presentation on the role of small business and Hanscom Air Force Base.

My first question would be the Air Force has recently announced acquisition reforms. Do you see that those would affect, either positively or negatively, the role that small businesses play in Hanscom Air Force Base?

Mr. HART. The major reforms that I have seen deal with the small purchase area and that area is one that is traditionally very heavily involved with small business. So, I can only see it improving our performance.

Chairman TORKILDSEN. I think the question that I had prepared you've answered, Captain, in your presentation, but I'd just ask you to go over that again. The C4I mission of Hanscom, which I and I think everyone in this room believes is critically important to the defense of our country, is heavily dependent on small business. That ability, as you pointed out, with computer technology advancing every 18 months, you cannot possibly utilize that benefit without a small business competitive structure out there so that the newest technology, the latest advances will be available.



Could you just expand on that a little bit, perhaps either with examples or just in general, on that role?

Captain SULLIVAN. Well, sir, I think you summed it up very well right there. Yes, it is highly dependent. We use many of our support contractors within the program offices and they are spread throughout. They're able to give us the technical expertise that is quickly evolving, that can be rapidly pulled out of industry or pulled out of academia and brought into the program office. They give us a great deal of expertise in doing certain functions within the program offices, like our contracting support or developing a certain type of radar technology, something like that.

For specific programs, I don't have those, sir, but I could definitely get those.

Chairman TORKILDSEN. If you could, for the record, that would be very much appreciated. Congressman Meehan, do you have any questions?

Mr. MEEHAN. Captain Sullivan, first of all, I want to congratulate you for living in the right Congressional district.

Captain SULLIVAN. Thank you, sir.

Chairman TORKILDSEN. I live there, too, Marty.

Mr. MEEHAN. You're right. I'm sorry about that. I'd like to ask all of you to what extent—one of the things we've found in terms of looking at small business, particularly those small businesses that are involved in manufacturing, is to be leading edge technology, which is really, I think, the hallmark of what the partnership here is doing between the base and the businesses, oftentimes involves the academic institutions, MIT and U-Mass. and some of the others.

I wonder if any of you could comment to the extent that the academic community, universities and higher education institutions are collaborating with these businesses and these contracts. If any of you could comment on that, I'd be interested in that.

Mr. HART. At least two of your witnesses, Mr. Henderson and Victoria Bondoc, are products of the universities of this area. I think that is the primary way the universities contribute to the small businesses in this area.

Captain SULLIVAN. Our laboratories also have agreements. I can't remember the name, adjunct professor, I believe that it's called. They swap students, and the people in the laboratories go down and teach courses. As Mr. Hart said, we have a lot of folks starting up these businesses.

Then the other thing is, as I'm sure you realize, MIT, for example, many of their graduates remain in the area and those are going to be sucked up by small business or our program offices or our laboratories. So, we benefit in a host of ways. Just the cross-fertilization of people moving throughout the industry is a huge benefit.

Mr. MEEHAN. Thank you.

Chairman TORKILDSEN. Thank you. Congressman Kennedy?

Mr. KENNEDY. Thank you, Peter. When we went through the closure of the Watertown Arsenal, the whole concept was somebody came up with a study saying that the Army could save about \$10 million on shutting down the Watertown Arsenal. Nobody took into account the fact that it would cost \$50 million to build a building



down in Aberdeen, Maryland to conduct the same exact tests that were being conducted, at least in terms of the building cost, for free in the Watertown Arsenal; that it would cost \$250 million, as it already has, to clean up the site.

One of the worst things about getting your base closed down is trying to get it cleaned up afterwards. But the advantage of mine getting closed down first was I actually got the money to get mine cleaned up. The ones that are closed down now, I think you're going to be waiting well into the 21st Century or 22nd Century, in some cases, to get the money to be cleaned up.

The reason I bring up the point is that it isn't just—I would imagine the Base Closure Commission, as it goes into each community, hears tales of woe as to how many small businesses are going to be affected, how many jobs are going to be affected, and if that were the sole criteria, I think that we'd see very different results than what we've seen to date.

The real question is whether or not the Hanscom Field—whether Hanscom itself has such a unique mission that only really be accomplished through this sort of meshing of both the academic community, the FFRDC's in terms of Lincoln and Mitre and the like, coupled with the small businesses and the kind of big businesses that exist out here on 128 and whether or not the meshing of all of those together as one integrated program really could possibly be replicated to create the kind of tremendous advancements in technology that have been accomplished at Hanscom Field.

So, I wonder if whether, Colonel Collins, you might want to make a comment on the integration that you have been able to achieve as an officer representing the base command here this morning, and whether or not you really believe that that could be replicated in any other place around the country.

Colonel COLLINS. As you have summarized, there is a lot of synergy between the universities, between Route 128 and between the base. As far as whether we can replicate that anywhere else in America, I really can't speak to that, but I do know the linkage we have with the local universities and with the businesses up and down 128 and the small businesses that we rely on here. We have a solid link. It's built, it's in place, and what would the cost of reestablishing that link somewhere else be, I can't speak to that.

Mr. KENNEDY. Instinctively, wouldn't you say it would be a heck of a lot more if you had to rebuild that infrastructure someplace else around the country?

Colonel COLLINS. Instinctively, again, I can't speak to that, but I can tell you the tie that we have here is solid and we have an excellent working relationship. Whether we could it elsewhere in America, I'm not—

Mr. KENNEDY. No doubt that we could accomplish it someplace. The real question would be whether or not it would be cost-effective to accomplish it someplace else. If that puts you in an awkward situation wearing a uniform, I didn't mean to accomplish that. I just thought that it would be fairly obvious to folks that were familiar with this that it would have a tremendous additional cost no matter where else you establish a base.

I don't know whether Al or Captain Sullivan can comment on that or not. This is back on the job here, Colonel.

Captain SULLIVAN. I'm lower ranking.

Mr. MEEHAN. You don't have as much to lose.

Captain SULLIVAN. That's right. They brought the scapegoat here. Well, I think in the study that we saw in Fortune magazine about a 1½ years ago that ranked Boston as one of the highest high tech areas in the country and the leading one in universities and technical and professional services and in the top three in venture capital innovative firms, things like that, research laboratories, those type of things.

The C4I mission, as you alluded to before, we saw in Desert Storm the information warfare is essential and vital. Now, you realize that the enemy has the same capabilities to commercial off-the-shelf technologies and engineers. So, that's what we're competing against and we do need to be immersed in an environment that we can reap those benefits rapidly.

The study also showed that Boston is one of the most vital software development areas, and so that is essential. As you say, it's very expensive. It's not so expensive to move office buildings. It is more expensive to move the laboratories and it's very expensive to move people. So, you have to have a big gain, and that's what the BRAC Commission has to determine if you do move Hanscom. There is also the cost of productivity that's lost, which is probably far greater than the cost of actually moving people or building buildings.

Mr. KENNEDY. I appreciate the answer, Captain. I think that anybody that does a cost-benefit analysis for the tremendous technological advances that have been made and trying to replicate that kind of synergy amongst the four various factors, including the military personnel, those that work in small businesses, those that work at the very large business, coupled with the university environment, I don't think you're ever going to find any place throughout the country that has all of those in place now with the kind of advancements that have been made right here.

So, the notion that you could somehow cut this program out, send it off to some other part of the country and get the same kind of process together that would create these advancements—you might be able to accomplish it, but it would be at a tremendous additional cost.

So, I think what we're trying to suggest is that anybody that really takes a hard look at this particular instance, I think, cannot come to anything but the conclusion to keep Hanscom Field open. I hope this isn't the kind of situation where we see this come up year in and year out and you have to go through this every year.

I just look at the cost and everything else of putting on these hearings, of all of you that have come to this hearing today that should be out there advancing your companies, paying attention to how to keep our country strong and how to keep your companies strong.

I hope we don't put this in the kind of syndrome where each and every year there has to be some justification. It really is a terrible deterrent from what people should be—productive issues people should be spending their time on. In addition, once these decisions get made, I would hope—and these are the fellows that work on Armed Services, but I hope that we could come up with some kind

of relief that gives at least a safe harbor for a period of years so that this doesn't just keep coming up year in and year out.

Do either of you have any thoughts on that? Is there any kind of movement on the Armed Services Committee to deal with that?

Chairman TORKILDSEN. In direct answer, Congressman Kennedy, at this point, I'm not aware of any effort. It makes sense, though, in terms of long-term planning and resource allocation, it should be there. I hope to address it as part of this year's just annual defense authorization separate, because it needs to be done over and above the BRAC process.

Again, the focus of this hearing isn't the BRAC process. The focus is the small business role. But I think the questions you raise are quite legitimate and do need to be answered.

Congressman Meehan?

Mr. MEEHAN. Well, certainly, I've seen through the whole Fort Devins process the need. We have had to really start from scratch. I'm a little more fortunate than Congressman Kennedy. Devins was closed before I was elected. So, it was kind of an advantage there. But what we've found is the need for the Department of Defense in many instances to kind of do a better job on this and there have been efforts that former Chairman Delums and Pat Schroeder had been working on.

So, I think we'll see some initiatives coming from the National Security Committee over the next year or so, as soon as we finish with some of the items in the contract and some of the other items we'll be having hearings on.

I wanted to specifically ask a question. I was very impressed with the presentation regarding small business obligations and the amount of money that small disadvantaged firms had been involved with. I was wondering if there were any—and we're always looking to find ways to give incentives to get disadvantaged firms involved.

I was wondering if there was any kind of particular outreach or how have you done such a good job in terms of getting those firms involved? Because, frankly, it's extremely impressive to see that and what I see here is a model, frankly, that we ought to be able to use elsewhere in the country.

Mr. HART. Congressman, we've been fortunate in that we've had a series of commanders who were very supportive of the program. You people put into statute the Small Disadvantaged Business Set-aside, which was a great tool in enabling us to get some of these numbers.

Chairman TORKILDSEN. Thank you. Just as a final comment, and I appreciate, Captain Sullivan, your point in response to Congressman Kennedy's question. The cost factor is enormous just in terms of trying to move buildings, trying to move people. You can't measure fully the loss of productivity that any such move would make. Even if you could move all of the individuals who work for the Air Force, either in uniform or civilian, even if you could move the support businesses, you can't move the universities that are a key part of this equation. It's not possible.

So, for my own belief, and I think it is thoroughly backed up by the evidence, you could not replicate the unique role that Hanscom



plays because you could not move all the contributing individuals and contributing institutions to it.

I hope that that's the message that everyone in a position to decide will look at, certainly a message that I think the delegation with Senator Kennedy, Senator Kerry and Governor Weld and every Member of the House brought to the Secretary of the Air Force last week. It's a message that I will continue to promote as much as possible.

Hanscom does play a unique role in the defense of our country and certainly there is no cost savings in moving its function. Certainly, I think there would be a loss if it was ever attempted. That's my belief and I will keep working to promote that.

I want to thank you all for your testimony, the very well prepared, very important information you've brought to these hearings, and appreciate your comments very much. Thank you.

Captain SULLIVAN. Thank you, sir.

Colonel COLLINS. Thank you.

Mr. HART. Thank you.

Chairman TORKILDSEN. Our next witness will be Mr. Sanford Weiner, a research associate at the Massachusetts's Institute of Technology Center for International Studies. He has recently authored a study on the importance of Hanscom to the local economy. If you want to just sit front and center, Mr. Weiner, we will quickly do a change of name cards here for you.

Mr. WEINER. Low technology.

Chairman TORKILDSEN. Mr. Weiner, as with the other witnesses, your written statement will be included in its entirety in the record, if I could ask you to summarize your comments for us. Mr. Weiner.

#### **TESTIMONY OF SANFORD WEINER, RESEARCH ASSOCIATE, MASSACHUSETTS'S INSTITUTE OF TECHNOLOGY CENTER FOR INTERNATIONAL STUDIES**

Mr. WEINER. Thank you, Mr. Chairman, Mr. Congressman. Indeed, we have just produced a report at MIT's Defense and Arms Control Program that addresses some of the issues that you've just been talking about.

It is quite true that the presence of Hanscom has stimulated in many ways the development of small business and development of scientific and engineering resources here in Massachusetts, but if we want that to continue, we do have to continue making the case that this teamwork has been very good for the Air Force and very good for the United States.

Our report set out to examine some of that in a bit more detail and it documents some of that. So, I just wanted to talk briefly about systems integration and the team that's been put together at Hanscom over the years and the importance that it's had.

Perhaps I should start at the end of the story, where Captain Sullivan referred to C4I and the mission. The most prominent recent example of that is, in fact, the JSTARS radar plane, which was sent to the Gulf War, in fact, prematurely; that is to say it was still in the midst of its original development. Engineers from Grumman and from Boston and from Mitre actually went along on

the plane and went into combat as they kept developing—that is to say advancing the technology night by night.

In fact, in the official Air Force history of the war, they conclude that for Desert Storm, JSTARS stole the show and go on to describe how, for the Air Force and the Army personnel involved, that the new information on these radar screens was almost magical because for the first time ever, you had a radar plane that could be 20,000 or 30,000 feet in the air, could see 100 miles beyond the enemy's front lines, looking in the middle of the desert in the middle of the night, and, yet, the enemy formations lit up on the screen as if they were in the middle of Times Square. We, in fact, reprinted some of those famous photographs about how amazing it is.

In fact, JSTARS is a program that involves many contractors around the country. So, the key question becomes what is there unique about the Boston team, about what happens here at Hanscom and at Route 128, and that goes by the name of systems development and systems integration. That is to say they build it in many places, but the original conceptual design and engineering process takes place here.

That turns out to be sometimes long and painstaking. This took nearly a decade to do right because it was pushing the technology by a factor of 10 beyond what anyone had ever tried to do before, which is why it seems so magical now when they've concluded it.

But it required the Hanscom team to be monitoring and evaluating simultaneously the technological frontier in several different areas; in radar developments, in computing, and in communications technologies; and to envision how all of those would fit together into a new weapon and how you'd fit them all onto a plane, and then to figure out the cost-effective way to optimize those various alternatives.

In fact, there was quite a bit of doubt that technology that successful could even be done no matter how much you spent. So, it was the integration of these different technologies and the ability to foresee that that produced this remarkable advance.

But to get integrated technology at the cutting edge in many different fields requires a very special kind of integrated project team. That's what Hanscom and ESC have been paramount in doing. That involves, in fact, two sorts of kinds of integration. One is the formal kind that you saw a minute ago on the screen about particular contracts.

Hanscom has built a partnership both with the uniformed military personnel from the Air Force, with the Federal contract centers, such as Mitre and Lincoln Labs, with some of the major local contractors, such as GTE, Raytheon, and Digital. The computers in this system started as Digital, were rebuilt for military use by Raytheon, and then integrated by Mitre and their small business contractors into the JSTARS platform as it was being developed.

Yet, while the hardware came from some of the larger contractors, the unique software needed to make this system work, to do radar detection at this unprecedented sensitivity, came from numerous small businesses, some of which were listed on the screen and some of which you will hear from later in this morning's session.

Some of these were new firms that the Hanscom people actually helped get started. Some of them were existing, but extended work into this area. So, that it is, in fact, in the formal contract sense, been a true partnership of small engineering firms, of major contractors, and the Federal contract centers to do this kind of systems integration.

But, in fact, as you were just referring to briefly before, to have this take place at the cutting edge, at the technological frontier, really requires that all these people who are listed on the contracts be part of this much larger and informal technological community that Boston is famous for. In fact, even on the front page of this morning's *New York Times*, you'll see that New York now aspires to be like Route 128 in Massachusetts.

So, it is that infrastructure of the available universities, the engineering companies, the world class expertise in software and computer hardware that Hanscom brings together. As you were just pointing out a minute ago, this is a function that even a much smaller Air Force is going to find paramount in the future and it's the sort of thing we should be preserving in the Air Force, even if other things have to be cut back.

Chairman TORKILDSEN. Thank you very much. I'm going to take the unusual step, Mr. Weiner, of asking if you might be willing to interrupt your testimony for just a bit. Governor Weld has just joined us and I know he's on an extremely tight schedule and we're most appreciative of him being here. If I could just ask you to yield the floor to the Governor and then we'll continue with your testimony afterwards, I would be most appreciative of that.

Mr. WEINER. Certainly.

Governor WELD. Good morning, Mr. Chairman.

Chairman TORKILDSEN. Good morning, Governor Weld. Thank you, Governor, from everyone here. Our next witness is no stranger to anyone in this room. Governor Weld has built a reputation as being a strong advocate for small business throughout Massachusetts. A number of initiatives he has taken have already come to fruition in the Commonwealth.

He has also taken a lead role in promoting Hancsom Air Force Base both in Washington and in Massachusetts. We are most appreciative of all the work he has done and most appreciative that he has been able to testify before the subcommittee today. Governor Weld, thank you for being here.

#### TESTIMONY OF WILLIAM F. WELD GOVERNOR OF THE COMMONWEALTH OF MASSACHUSETTS

Governor WELD. Thank you very much, Mr. Chairman. On behalf of the entire Commonwealth, which you represent so ably, along with Congressman Meehan and Congressman Kennedy, I want to thank you for holding this hearing here today.

I would like to take the opportunity to discuss briefly the importance of Hanscom to the country, both from a military point of view and, perhaps more to the point for today's proceedings, from a high tech and small business jobs point of view, as well.

As you know, any military historian will tell you that technology has traditionally played a critical role in armed conflict and that has been true from the days of crossbows all the way to computer-

guided missiles. Now, I think it's fair to say that the future success of our combat forces in deterring or defeating adversaries in the field is going to depend increasingly on technology.

More specifically, whoever can gather information most quickly and communicate that information to forces in the field is going to win future wars. The past emphasis on mass fire power or numerical advantage is going to be giving way to information management, precision bombing and electronic counter measures.

When it comes to technology, Hanscom is a national leader. During the Gulf War, as you know, the systems developed at Hanscom, such as JSTARS and AWACS, proved decisive in the swift victory of the coalition forces. As was mentioned when we all gathered 10 days or so ago at the Federal Reserve in Boston, the title of Hanscom really should be Hanscom Laboratory, not Hanscom Air Force Base.

Every State naturally is going to launch Save the Base campaigns, but I want to say that the groundswell of support for Hanscom here in Massachusetts is chiefly inspired by the recognition that American lives are in the balance, as the Pentagon decides where to acquire its technology. We think Hanscom is an obvious source to retain and even expand.

That brings me to the second point. As many of you well know, the Route 128 area is a global center for leading edge technologies and highly educated workers and is especially important in the technologies critical to producing world class C4I systems. Besides being the east coast headquarters for software and telecommunications, we also have systems integration and engineering firms, to whom, I might say, Hanscom outsources 80 percent of its engineering support work.

President Clinton and his administration have talked frequently about improving the country's technology base; in fact, they've launched a technology reinvestment program to enhance, and I quote, this is the Clinton administration's priority, "regional industrial capabilities that are important to national defense."

I would suggest that the firms around Hanscom already comprise the country's strongest regional technology alliance. Secretary Perry himself has talked about the fact that our technological edge today in defense comes from our commercial technology base.

Hanscom is firmly integrated into Massachusetts' technological and entrepreneurial fabric and we believe that relocating the Air Force's Hanscom facilities would be not only a mistake, but a very costly mistake. It would disrupt and weaken the quality of the Air Force's C4I systems, would force the Air Force to spend precious time and money reconstructing the technical base that already exists here, and would certainly be harmful to the commercial high tech cluster that has developed so successfully in this area.

The work done at Hanscom really stole the show and saved lives in Desert Storm. Small businesses in this area are now working with Hanscom on engineering services, on intelligence systems, on physical security systems, and on advanced R&D with broad military applications. In addition, there are companies here that depend on Hanscom whom Hanscom, in turn, depends on for construction work, base maintenance services, travel services and the like. These companies, for the record, include Infotech Develop-



ment, MEI Technology, Sencom Corporation, Assurance Technology, Horizons Technology, Systems Resources Corporation, Analytical Systems Engineering Corporation, Abacus Technology, BTG, and Support Systems Associates.

These companies all have acquired millions of dollars worth of expertise that cannot be found elsewhere. I've seen figures—we've all seen figures that indicate Hanscom has \$1.2 billion in base level expenditures and \$3.2 billion in total economic impact to the New England economy. There are over 17,000 off-base private sector jobs that depend on Hanscom and many of those jobs are high skill, high tech positions that develop one-of-a-kind technology. You do not find workers with that kind of expertise to that degree of concentration in other parts of the country.

To illustrate the depth of the Commonwealth's commitment to keeping Hanscom up and running, last week the legislature passed and I immediately signed a \$100 million bond bill that can fund capital improvements at expanding Massachusetts military installations. I signed that bill on Friday. In other words, if this base stays open, as we think it should, we are prepared to offer a real sugar injection to help it further expand its mission and its effectiveness.

I thank you again for this hearing here today. Lieutenant Governor Cellucci and I are very much eager to work with every Member of the Congressional delegation and the entire Pentagon to keep this vital base operating and in fighting shape.

I'd note for the record that Lieutenant Governor Cellucci is meeting this morning with Assistant Secretary Gotbaum over at the NATICK Labs to discuss the future of those facilities, as well. We believe that both NATICK Labs and Hanscom contribute very strongly to Massachusetts and to the country.

Thank you, Mr. Chairman.

[Mr. Weld's statement may be found in the appendix.]

Chairman TORKILDSEN. Thank you, Governor, very much for your testimony. If I could just briefly ask you about the \$100 million infrastructure proposal that you made and, as you indicated, you signed into law. To me, I think that's a significant demonstration of the commitment of Massachusetts not only to see that the economic benefit of Hanscom or other bases continues, but also really a State—partnership is too strong a word, but certainly a commitment there.

Could you expand upon that? Just what type of things that Massachusetts can do to help out Hanscom and other bases with that 100 million?

Governor WELD. I'm not sure that I think partnership is too strong a word. I think it would be a partnership between the State government and the Federal Government. As we see it, the military has an opportunity not only to preserve what we've got at Hanscom, with all its lines into MIT and Mitre and Lincoln Labs, Draper, but to expand it and centralize the C4I capacity of all of the armed services at Hanscom. If that is done, you're going to need new facilities because there will be more people here, there might even be spillover to Devens.

But we want to make it attractive for the Federal Government to contemplate that type of consolidation here. So, that \$100 mil-

lion is to pay for buildings, offices, housing, infrastructure that otherwise DOD would have to pay for. This is an extension of a \$100 million authorization that was passed last year or the year before when DOD was considering putting a full DFAS facility at Southbridge, Massachusetts. It will be available for the expansion of any U.S. military base in Massachusetts, but most certainly this one.

Chairman TORKILDSEN. Thank you, Governor. Congressman Meehan.

Mr. MEEHAN. Thank you, Governor. First of all, let me congratulate you and your administration on your leadership on this issue. I have been impressed by your efforts and your administration's efforts to work in a bipartisan way with the members of the Massachusetts delegation, Democratic and Republican, in order to put our best foot forward in terms of our efforts to make sure that Hanscom is not—that it's recognized by the Department of Defense of the important contribution it makes to the defense of our country. So, I congratulate you on that.

I also will take this opportunity to congratulate you on the level of commitment the State has made relative to dual use technology and offer grants in the past. I think that as was seen in those programs, Massachusetts has been in a better position to compete for those grants because of the commitment and partnership on the part of the State government.

On the \$100 million commitment, I was wondering if you had any sense as to what that money would be used for, what vehicle would be used. Would it be something the Land Bank would try to institute? How would that work? Has that been determined yet? What would the firms, each of the small businesses that are here today, what potentially would they be able to—what advantages would they be able to get out of that money?

Governor WELD. I don't see the \$100 million going right into high technology. I see it going into the infrastructure to help the military in expanding. I'd be very surprised if the Land Bank would not be playing a leading role since use of military facilities is what they were initially set up for a couple of decades ago.

Mr. MEEHAN. My experience in working with the Land Bank—as you know, as I've indicated to you in other delegation meetings, I think the Land Bank has played a critical role in Massachusetts and done a very good job with regard to bases and also with regard to just providing economic development.

So, I thank you for your testimony and look forward to working with you to put that \$100 million to work, hopefully with the expansion of Hanscom Air Force Base.

Governor WELD. South Weymouth.

Mr. MEEHAN. South Weymouth. Mostly Hanscom, though.

Chairman TORKILDSEN. Thank you. Congressman Kennedy.

Mr. KENNEDY. First of all, obviously, welcome, Governor. I thank you again for your continued commitment not only to Hanscom, but to other bases throughout the State.

Obviously, I think you're in a very important position to try to help the Congressional delegation in Washington these days. I think with the cutbacks that are being anticipated, your participation in trying to fight and help us save these bases with the Con-

gress itself can be enormously effective. I know that you've spoken out time and again on both Hanscom, as well as Devins and Weymouth.

So, I think we want to work very closely with you in Washington to make sure that we do have a coordinated effort. From your statement, from the statements of the witnesses prior to your arrival, I think there's almost uniform agreement. I think that if Hanscom was on the chopping block in this particular room, we'd probably have a pretty good chance of keeping it.

But I think that the real question is whether or not when we're before the BRAC, whether we're going to be able to prevail. The State's commitment of the \$100 million, I think, is a big step forward.

Have you had any of your folks working with either the Department of Defense, with the key people at Hanscom to think through how we can potentially—if they do come to the conclusion that because of the unique synergy involved with Hanscom, that this would be a good place to put their resources in the future, have you had talks with the Department of Defense or with Hanscom and others about how particularly maybe the small businesses and the like, how that \$100 million can actually be put to work?

I know you sort of say generally housing and buildings and the like, but is that the edge that you're sort of looking for in terms of that \$100 million?

Governor WELD. It would be whatever the military felt that it needed, Mr. Congressman, in order to expand. This grew out of conversations I had with General Franklin and in its first form it was \$30 million Hanscom only and then it metamorphosed into being \$100 million statewide to encourage the military to expand bases throughout the State.

But there will be more people, if we're successful in persuading DOD to put all the C4I capability at Hanscom, it would be, depending on how they did it, 2,000, 4,000, or 5,000 more people. For the kind of work that's done, you can't just move into a vacant building at Hanscom or Devins or anywhere. It can't be cookie cutter real estate. It's got to be high end real estate. So, there would be a build out there and that's the sort of thing that the \$100 million would go to.

As a matter of fact, I might have been too quick in saying to Congressman Meehan that I didn't see that money going right into high tech. It's high tech real estate. So, I think some of those small business firms probably would be called on to participate in delivering the goods that the \$100 million would pay for.

Mr. KENNEDY. I guess the only other point I'd like to just make, generally speaking, is that we're trying to deal with some very tough budgetary decisions. You've done that here in the State. But at the Federal level these days, we're talking about very large scale reductions. You and I have discussed in the past concerns about MIT and the amount of money that comes into that university. It happens to be in the heart of my district.

There are potential cutbacks at Lincoln and Mitre. There are potential cutbacks in small business programs and a range of other issues as a result of both this recent notion of a tax cut, as well as the notion of trying to come up with a balanced budget.

I think that it's very, very important that folks in Washington listen to a voice such as yours concerning the priorities of the cut-backs that we face in this country. So, I just hope that you'll continue to speak out for those institutions that are going to keep America on the cutting edge.

But if we do that, obviously, there are going to have to be cuts in other areas and I just think that it's important that you very much become a player in terms of being willing to enter the fray of these discussions. If not, I'm very concerned that we'll see some of the very programs that this State depends on for its vitality and its standard and way of life be put on the chopping block.

So, I do think that you can play a very important role and be happy to work with you in trying to achieve that.

Governor WELD. Congressman, I strongly agree that any cuts at all in the area of research grants and dual use technology would be penny wise and pound foolish, and, I would argue, as a budgetary matter, as well as a qualitative matter, would not make any sense at all.

Mr. KENNEDY. That's terrific, Governor, but the fact is, as Marty can tell you and, I'm sure, as Peter can tell you, those are exactly some of the cuts that are on the table today as we speak that are put forward through the Contract on America. So, we have to recognize that there is—what you just said is in direct confrontation with some of the things that the contract calls for.

So, I just think that it would be great to have your voice on some of those issues.

Governor WELD. The Speaker has heard my voice on this one and President Vest has recently—I think recently met with the Speaker, as well. So, I'm with you on this one.

Mr. KENNEDY. Good.

Chairman TORKILDSEN. Just for the record, if I may, it's the Contract with America.

Mr. KENNEDY. It depends on your perspective. As long as it's not on you, Pete.

Chairman TORKILDSEN. On a follow-up point, certainly the Governor has not hesitated to disagree with the Speaker when appropriate, nor have I. In this particular case, this is just one other battle because people are looking for budget cuts across the board, including the Defense Department, but certainly every other department, as well.

We have to speak up for those which are the most cost-effective to keep them, including those research and technology grants that are part of the budget right now.

Congressman Meehan, did you have a follow-up?

Mr. MEEHAN. I was just going to say every time Newt gives a major speech, he mentions the Governor. So, we always write it down and say, well, we have to have the Governor send on a note to the Speaker. But I think the \$100 million is a major commitment.

I'm not sure that in the BRAC process that officially it will influence the decision, but certainly once we get a decision back, it will play a critical role in terms of the future expansion there. I think that's an important point to make. Under their criteria, it won't



necessarily be a factor any more than I think it was a factor under the criteria with Southbridge that we ended up with.

Yet, if we, in fact, are successful, and I believe and hope that we will be, that will play a critical role in making the types of advances at the base that I think all of us agree are in the long-term interest not only of Massachusetts, but of the national security of the country.

Governor WELD. Right. We're not trying to get into a bidding war. We're just trying to facilitate the process once the correct decision is made, as we hope it will be.

Chairman TORKILDSEN. Absolutely. Governor, thank you very much for your testimony and thank you for the leadership role the Weld-Cellucci administration has taken in keeping Hanscom open and productive.

Governor WELD. Thank you, Mr. Chairman.

Chairman TORKILDSEN. Thank you.

Now, resuming our scheduled testimony, Mr. Weiner, if you could return. Again, I thank you for understanding the Governor's tight schedule. Are you still proceeding with the summary of your statement?

Mr. WEINER. I just had two final points to make that follow-up on the discussion you've already been having. One is about shrinking Hanscom and the other is about expanding it.

The last point I was making, very similar to what the Governor was saying, is that this is a function for the Defense Department that is going to continue to be of importance. In fact, it is interesting that even as the DOD budget has come down in the last 3 years already, the budget for ESC, for this command, has stayed fairly constant, which is sort of an internal Government market test that the customers within the military see the importance of this or at least have up to this point.

So, this is not a function that's going to go away. The only question is whether you are misguided enough to pick it up and move the whole function somewhere else and try and start over again. That has several consequences. One would be just the obvious disruption of ongoing projects that these people are managing. They would be packing and moving. But the second question is would they pack and move, could you get this infrastructure to move whole somewhere else.

As Congressman Kennedy was suggesting a little while ago, that seems quite unlikely. A lot of these people are part of this team because it is in Boston and it is in this region and they feel comfortable, intellectually and professionally, as part of that larger structure.

So, then the third point is if a good part of the team did not move, how long would it take to recreate it on some less fertile ground somewhere else, and that does raise serious questions of how many years it would take and whether it would be possible to get it back to this level of integration and this level of quality if you didn't have the larger Boston resources to draw upon.

The alternative, the happier notion about expanding Hanscom to deal with all of DOD's needs in this area, rather than just the Air Force, is also interesting because it is worth noting that ESC has already made quite a bit of headway in the DOD's major agenda,

which is to have more joint programs in this area that serve all the services. In fact, JSTARS, which I started with, is a paramount example of that, as well, because it is, in fact, an Air Force plane that provides data both for other Air Force operations and, critically, for Army commanders on the field to be able to see what's going on behind the lines in ways they were never able to do before.

So, there is an argument for trying to bring the DOD stuff together, though there's a lot of stickiness that would stand in the way in terms of current practices and procedures. The ESC and the Hanscom team have, in fact, been moving in that direction already. So, that would be a natural expansion of the way they've been looking at their mission, I think.

[Mr. Weiner's statement may be found in the appendix.]

Chairman TORKILDSEN. Thank you very much. I'll defer my questions, first, to my colleagues. Congressman Meehan, any questions?

Mr. MEEHAN. One question, and I asked it earlier. I wonder if you could comment on the integration of the academic community with Hanscom and the role that it plays and futuristically the role it can play. As I indicated earlier, I'm of the belief that our ability to maintain global cutting edge high technology is going to require small companies on and about the Hanscom area, the 128 belt, working with the universities and I've seen some very impressive work between universities and small business.

I wonder if you could comment on those efforts and how you see them expanding in the future.

Mr. WEINER. I think I would agree that there has been an important interaction there, but a lot of it is quite subtle and more informal, not necessarily in formal contracts.

It is true that when ESC and Mitre and Hanscom try and draw on the monitoring of the advanced technologies, which is their first mission, that they start with things like talking to the people next door from Lincoln Lab who do the advanced research on radar. But those people at Lincoln Lab, in turn, talk to the people—Lincoln Lab, being an MIT affiliate, as you all know, they all talk to their colleagues back in electrical engineering on the main campus and to their colleagues at Harvard and Northeastern and Boston University.

But it's as much that the universities, particularly in their expertise in electronics and computing and software, have led to this sense of community that there are lots of people doing lots of cutting edge stuff in Boston and Cambridge and Route 128 and that the software center at Mitre or the various small companies that you're about to hear from, that's where they draw their people from, that's where they have the engineering society meetings, and those are the people they go to lunch with when they're brainstorming about the new ideas that 10 years later are going to result in new weapons platforms that embody that critical technology.

So, some of it is formal dollar flow and contracts, but a lot of it is just being part of this great infrastructure. When you ask people about it, they have to stop and think about it a little because they take for granted that they will be having lunch with so-and-so or going to this seminar and doing that. It's only when you live somewhere else for a while that you discover the absence of that and

realize how much that impedes the kind of work it takes if you want to be on the frontier of these various things.

Mr. MEEHAN. Thank you.

Chairman TORKILDSEN. Mr. Kennedy.

Mr. KENNEDY. Sanford, just a brief question dealing with the small business end of this equation. Can you talk just a little bit about the—first of all, I'm just interested in whether or not there would be, over the course of the next 10, 15, or 20 years, opportunities for business spinoffs as a result of this kind of technological advancement. It might not be completely dependent on Pentagon dollars, but, nevertheless, might create the kind of leaps in productivity that could end up to real jobs in the private sector, first.

Second, can you just tell us a little bit about your notions of that same kind of synergy that might exist with the small businesses in this community? It's one thing to talk about the MIT and Harvard and Northeastern, but there's a lot of very small businesses that have, as the Captain indicated, some of the best technologies in software, or maybe you said, but, anyway, were provided by the small businesses, not just by the big ones.

So, it seems to me something is going on there, as well.

Mr. WEINER. In the informal thing I was just discussing, I meant to include them, as well, because I see them—technically, they are small businesses, but what they really are is collections of skilled engineers and Ph.D.'s, some of whom were trained at Harvard or MIT, some of whom came to the Boston area because they thought it was fertile ground for the kind of things they wanted to do.

I think in some of the testimony you're going to hear from them directly, they will be elaborating on some of that. Some of them have taken civilian technology and brought it to be used for military purposes and then, having it enhanced with some Federal money, are now taking it back to the private sector.

So, I see particularly with the intense advance in computing power, in just the raw power of computer hardware, that that will become embodied in far more industrial processes, both of military and civilian uses, and what was once a very expensive way to coordinate things will become ubiquitous and that being in one of the world centers where that takes place will be good both for the military and for the civilian economy.

It's hard to predict technological trends specifically and a lot of people who do it have turned out to be wrong, but it's easy to look at the broad picture and see that that's where it's going, that we're going to be able to put more computing power, distribute it in more places. I don't just mean the internet, I mean in automobiles, in manufacturing. We will go from smart weapons to smart machines of a lot of sorts and that will allow smart people to move back and forth.

Mr. KENNEDY. I appreciate that. I think that it would be really interesting to hear not only from you, but from the small businesses as to what opportunities they see in the future as a result of this direct association.

As somebody who started several small businesses before I went to the Congress, I always found that you've got to kind of head it off in one direction because there's a contract there and then all of a sudden, four or five light bulbs are starting to pop off in your



head about how you can try to do this in some other area, and they all sort of end up fitting in.

If you've got one contract that you can depend on that then allows you to try a little bit—put somebody on another idea that you might have had for 20 hours a week or something and then all of a sudden he comes back in and says this can develop into another interesting aspect. It's sort of what I found as one of the more interesting and sort of fun aspects of running a small business.

So, I think that all of you should feel that you are playing an important role not only for our country, but in your own communities. You're hiring a lot of people, you're getting a lot of things done.

I want to let the Chairman know that, again, because of that contract that I'm so pleased with these days, I actually have got to head back to my district. I promised a homeless shelter that I'd come by there this morning. So, I apologize that I won't be able to stay with you for the entire proceedings, but you can rest assured that if any of you need a helping hand throughout this battle, please feel free to contact my office and I hope we can do for you a little better than I did for my own base.

Thank you all very much. Good to see you.

Chairman TORKILDSEN. Thank you, Congressman Kennedy. For those of you who cannot see the photographs, one of them is, I think, known as the "mother of all retreats," the title that Secretary Dick Cheney gave to the JSTAR picture which showed the mass exodus from Baghdad. But thank you, Congressman Kennedy, for joining our panel.

Mr. Weiner, just one quick question. As you know, new weapon development and also systems development is a very difficult task. It's going to be even more important in the future, though, as we have a smaller military and, at least as far as President Clinton has projected, defense budgets that will continue to decline in real terms into the next century.

How important, from your perspective, is the technology infrastructure in place now to new weapons development and new systems development and how does the small business community play a part in that role?

Mr. WEINER. Well, I think that expands on the discussion we've had to this point. I would pick up the notion that the Governor mentioned. We are in the middle of a technological revolution in the way we carry out warfare. We have moved from a notion of mass fire power to precision weapons of all sorts.

But the point about precision weapons is that their precision depends on accurate, real-time intelligence about the target they're trying to hit and it's precisely the kind of weapons of radar and communications that the Hanscom team has been working.

So, what at one point was thought of as sort of an overhead mission, the radios between battalions or between Air Force wings, actually, in the last decade or two and increasingly in the next decade or two, the C4I, as the jargon goes, becomes a central focus of military effectiveness. It's not just talking back and forth. It's the precise information about getting a missile to a target.

So, I think that the way we do that, staying ahead of our potential adversaries and their attempts—now, each of these technologies can be interfered with or countered in various ways. So,

that the only way you stay ahead of the potential adversaries, which is what we want the military to do, whatever size military we feel is appropriate, is to be, as we've been saying, on the cutting edge of those things in each of the disparate technologies that you need to bring together.

I think that to come back to the earlier point, the key point about the Hanscom team is that it is a team that integrates these various things together, integrates both, organizationally, large business and small businesses. It integrates intellectually these various different technological paths and that's the only way you can stay ahead.

Just one final anecdote about JSTARS in the war. There was a moment early in the war when Saddam Hussein actually thought that he could send two or three divisions down through the desert in an area where they wouldn't be obviously visible and could lure some of the American divisions across the battle line prematurely and trap them and have a very bloody incident that he was looking to show up on C-SPAN or on cable news one night, and actually thought he might alter the whole course of the war by this one three-division trap.

In fact, what happened was the exact opposite. JSTARS and some of our other electronic surveillance planes picked up these divisions when they were 50 to 100 miles behind the front line, still way in Iraqi-held territory, far away from the American Army divisions. It was the middle of the night, so they thought they were protected. But, in fact, the JSTARS called in wave after wave of American bombers that totally decimated three whole divisions that never made it to the front line, that wound up retreating just from this unrelenting air attack.

That was clear to all the coalition forces that this was the prototype of the kind of war they want to fight in the future.

Chairman TORKILDSEN. Mr. Weiner, thank you very much for your testimony. It is very much appreciated. Thank you for your time here.

Mr. WEINER. Thank you.

Chairman TORKILDSEN. I'd like to call the next panel before us, the final panel, individuals who own or run small businesses that deal with Hanscom, if they would come forward at this time. Thank you very much.

Our panel is represented by five individuals who work, at least in part, with Hanscom. They are Mr. James Henderson, the CEO and president of Analytical Systems Corporation, based in Burlington, Massachusetts; Mr. David Vining, who, along with his brother, Michael, now run Vining Disposal Services, which was started in 1946 and is based in Stoneham; Mr. Peng Siu Mei, president of the Mei Technology Corporation, which he started in 1985 and which is based on Lexington, Massachusetts; Mr. Samir Desai, president and Founder of Systems Resources Corporation, based on Burlington, Massachusetts; and, Ms. Victoria Bondoc, president and CEO of Gemini Industries, a defense contracting company which she started 9 years ago and which is based in Bedford, Massachusetts.

If I could again ask all of you to summarize your statements, your written statements will appear in their entirety in the record.

I would ask each one of you to summarize your statements and then we'll proceed with questions. We'll start with Mr. Henderson.

**TESTIMONY OF JAMES HENDERSON, CEO AND PRESIDENT, ANALYTICAL SYSTEMS CORPORATION, BURLINGTON, MASSACHUSETTS**

Mr. HENDERSON. Thank you, Chairman Torkildsen. First of all, I would like to thank you both for the opportunity to speak as a small business executive and as a founder of Team Hanscom.

I really want to thank the delegation for the strong support in making the case for the Electronic Systems Center and Hanscom Air Force Base. Many in the military have the perception that Massachusetts is not a friendly, supportive environment. I believe that that image has been dispelled by the bipartisan cooperation and resolve to defend the base.

The \$100 million bond that the Governor spoke about, the presentation to Secretary Widnall, and, frankly, this hearing today demonstrates a real commitment to the critical role that the Electronic Systems Center plays in the technology alliance of eastern Massachusetts.

The Electronic Systems Center and Hanscom Air Force Base have always been leaders in including small business as full participating partners. My company, ASEC, has been a contractor at Hanscom Air Force Base for over 20 years. In fact, our first contract was for a project at Hanscom. They were willing to take a chance on a very small company.

In 1978, 7 years after our first contract, we won our first large small business setaside procurement. It was here at Hanscom Air Force base. It was for 70 man years per year of systems integration support for the Department of Defense physical security program. As a part of this program, we helped design the system used to verify missile production at two Soviet plants under the INF treaty. The system used x-ray technology to examine railroad cars transporting missiles from the plants.

The United States was not allowed to open the railroad cars, but had to rely on an x-ray image for verification. This experience led us to look for commercial applications of the inspection technology. A longstanding problem in the United States is inspection of ship's containers. Few containers are inspected. One container may require up to 8 hours to be manually inspected. A 10 percent manual inspection rate would stall commerce. We, as a small business and at our own expense, set up a demonstration facility to show the value to cargo inspection.

ARPA visited the facility and, based upon their evaluation of our results, funded our moving the system to the Port of Tacoma to an operational setting. During the past year of testing, the system was successful in identifying over 90 percent of the contraband hidden in the containers using the x-ray image enhanced by the system software. The contraband ranged from drugs to weapons. Up to 30 containers per hour could be inspected with one system versus one container per 8 hours using manual inspection.

We believe that this system should be installed at all major ports and border crossings. It would reduce manifest cheating, control technology transfer, and put a roadblock in the drug traffic.



I believe that this demonstrates a successful technology transfer from a DOD project to a commercial application. It happened here at Hanscom Air Force Base.

The indirect benefits to the small business community, with its relationship to the Electronic Systems Center, are difficult to measure. My example of the inspection system would not show up in any statistic. If the Electronic Systems Center had not been a supportive environment for small business, we would not have been able to expand our business base to other locations with the Department of Defense. We got our start here at Hanscom Air Force Base.

If the Electronic Systems Center were to move, I believe that there are over a thousand small business direct jobs that would be affected in the local area. Small businesses would take a major hit. Beyond the disruption of the small businesses, a significant part of the systems engineering and integration talent that supports the technology knowledge base would be lost in the move. The fostering environment would be lost that has produced a vibrant small business community.

I believe that the small business has been an integral part of the fabric that has produced world class C4I systems at Hanscom Air Force Base. I am proud of the contribution that small business has made to the mission to the Electronic Systems Center. It would be a major step backwards for small business in Massachusetts to lose this relationship.

Thank you for the opportunity to put these comments on the record.

[Mr. Henderson's statement may be found in the appendix.]

Chairman TORKILDSEN. Thank you, Mr. Henderson. Mr. Vining.

#### **TESTIMONY OF DAVID VINING, VINING DISPOSAL SERVICES, STONEHAM, MASSACHUSETTS**

Mr. VINING. Yes. Good morning, Mr. Chairman and Congressman Meehan. I'm David Vining and I am vice president of Vining Disposal, a closely held corporation and family business.

In wanting to be brief and highlight what I feel is the most important part of my testimony, I'm going to really skip the history of the company, which you do have as a part of the record. Being extremely proud of my company, there are some two or three points within that history I would like to point out.

My brother and I began in 1972 with one truck and annual sales of \$24,000. We presently today run 60 trucks with annual sales of \$12 million. In closing on the historical, I would just like to say that Vining, a company of vision in the '70's and '80's, can be counted on to be major player in the '90's as the industry and the country goes from a wasteful society to one of reclamation and reuse. I think that's extremely important because the waste disposal industry is in significant transition from one of disposal to one of reuse.

What I would now like to speak to is the direct and indirect impact of the base closing to Vining Disposal. The direct impact is to Vining Disposal, but the indirect impact which will be felt by Vining I feel will be echoed by a significant number of other small

businesses not only in the service sector, but within retail and within professional services.

The direct impact to Vining of the base closing would be a 4.6 percent reduction of gross, approximately \$550,000. We would also experience a loss of capability to recover the \$300,000 of capitalization that would incur by the amount of \$5,000 per month for each month that the contract is ended early. Those are the direct impacts to Vining.

The indirect impacts to Vining, which I believe will be echoed throughout the other small business sector, would be a reduction of our commercial base by the either elimination of downsizing or our commercial customers who are affected by the base closing. We estimate that to be 20 percent. Another indirect impact to Vining would be the potential loss of our municipal customer base, our curbside rubbish and recycling contracts.

As we all know, when municipalities become financially strapped, they begin to look to cut and the first place historically they have looked to cut is in waste collection. We believe that that could be a potentially 14 percent hit to our gross.

When we as a company look at the direct and indirect impact to our company, 4.6 percent direct and a potential of 34 percent indirect, for an aggregate total of 38.6 percent, are a dollar value of \$4,632,000. It would also mean the elimination of 40 jobs.

Those are the direct and indirect economic impact statements that I feel are significant, but are mirrored throughout the country in arguments that will be made by other small business contractors to military installations. A point that I would like to highlight, which is a noneconomic impact, is that as a result of our company working for Hanscom, we have benefited from the exposure to a higher standard of business practice required of any firm contracting with the Government.

Because of the stringent requirements of our Government contract, our business has achieved a higher level of professionalism, which has directly benefited our employees, our customers, and the community as a whole. Other small businesses can benefit from this contractual relationship. But if Hanscom is closed, that opportunity will cease. Government loans, pamphlets, advice, et cetera, is no substitute for experience.

Real work under real contractual requirements benefit the Government and benefit small business. Thank you.

[Mr. Vining's statement may be found in the appendix.]

Chairman TORKILDSEN. Thank you very much, Mr. Vining. Before we proceed with Mr. Mei, I just briefly will note that Margaret Sherry, from Senator John Kerry's office is here. Senator Kerry could not attend personally, but we appreciate him sending his representative here.

Mr. Mei.

#### **TESTIMONY OF PENG SIU MEI, PRESIDENT, MEI TECHNOLOGY CORPORATION, LEXINGTON, MASSACHUSETTS**

Mr. MEI. Thank you for inviting me to the hearing today. I would like to summarize the history of my company, our relationship with Hanscom, how my company will be affected by base closure, and my assessment of the closure's economic impact on this area.

I immigrated to the United States in 1952. With the help of scholarships and part-time jobs, I graduated from the Putney School in Vermont and received a Bachelor's degree in mathematics from Harvard, a Master's degree in mathematics from Brown, and a Ph.D. in computer science from Purdue. I entered the computer field in 1957, while still in college. I was hired by Honeywell in the summer as a computer operator.

I started Mei Technology in my basement in 1975, but was not able to sustain the company. I tried again in 1980 and this time was successful. The company grew from one person to 220 people today, with revenues of over \$26 million. The company has offices in different parts of the country. However, more than half of the employees are in our Lexington and Bedford offices.

Mei Technology offers services in computer systems integration, software/hardware development, and engineering support to the major Department of Defense and the Department of Transportation programs. We have a senior, well educated technical staff, with degrees in sciences and engineering. More than half of our staff have advanced degrees.

Hanscom is by far the company's largest single client, accounting for more than 60 percent of our business. It did not start out that way. Recognizing the need at Hanscom for competent engineering support at reasonable prices, we painstakingly built a staff of engineers and scientists educated in the fine local universities, such as Harvard, MIT, Tufts, the University of Mass., BU. Furthermore, we made use of the fine skills and talents of many retired, but still young Air Force personnel who could make measurable contributions to the ESC in a civilian capacity.

As a result, our staff has up-to-date technical and engineering knowledge to support Hanscom's unique requirements for developing sophisticated electronic systems for our national defense. Equally important, we possess sufficient knowledge of the intricate internal workings of the Air Force acquisition community to provide very cost-effective privatized high tech service to support Hanscom.

A recent testament to the success of our business approach came when we won the 1994 Small Business Administration's award of Prime Contractor of the Year for New England. The two people who initiated the nomination run the Small Business Office at Hanscom, Al Hart and Dave Condon, and they are the main reason why Hanscom is one of the very few military bases that consistently exceed their small business goals.

If Hanscom closes or the Electronic Systems Center moves away, the impact to our company would be devastating. I estimate that most of our Massachusetts employees would not have jobs and many of the people in our other offices would be affected because a number of them work on Hanscom projects in conjunction with our local staff.

We have built a unique capability to satisfy a market need. We have built a dedicated staff, using the local talent unique to this area. I strongly believe that if Hanscom's electronics activities leave this region, the country would be losing a great deal of talent unique to this area of world class universities, laboratories, computer hardware and software firms, and developers of state-of-the-



art electronic systems. Silicon Valley in California and the Massachusetts high tech industrial complex are world leaders in emerging state-of-the-art electronic products. Hanscom plays a key role in that industry.

Mei Technology is but a small firm with monthly payroll of a million dollars. One may erroneously conclude that over 100 people losing their jobs will not adversely impact the region. However, if we multiply the impact by the hundreds of firms, many of them small business like Mei Technology that would be affected by losing Hanscom, one can appreciate the serious effect of the thousands of jobs that would be lost.

More importantly, we would be losing a part of our competitive edge in the world of high tech electronics leadership.

[Mr. Mei's statement may be found in the appendix.]

Chairman TORKILDSEN. Thank you very much, Mr. Mei, for your very significant testimony. Mr. Desai.

#### **TESTIMONY OF SAMIR DESAI, PRESIDENT AND FOUNDER, SYSTEMS RESOURCES CORPORATION, BURLINGTON, MASSACHUSETTS**

Mr. DESAI. Good morning, Mr. Chairman, Congressman Meehan. I appreciate the opportunity to appear before you today and offer my views on Hanscom Air Force Base and its economic impact on small businesses.

I believe my company is representative of the small businesses in Massachusetts that support Hanscom Base, in general, and especially in this particular geographical area. Our company provides the following services to customers in the public and private sectors; they are C4I, information systems and related services, applied research and technology, and technology transfer.

SRC employs approximately 400 employees, about 80 of whom work for Hanscom Air Force Base. They work on the programs entitled JSTARS, AWACS, mission planning, and AWDS, (automated weather distribution services) that you have heard about this morning. In addition to our own personnel, our Hanscom contract supports an additional 35 employees by our subcontracting activities.

The R&D and technology advancements for which ESC is internationally renowned are not products of a single organization. They are the fruits of the region that is home to some of the world's most prestigious universities and R&D centers. Our region possesses unique capabilities and resources and an infrastructure that has been built and matured for over 50 years.

The term Team Hanscom is more than a rallying cry. It is a statement of fact. The expression, "Don't throw the baby out with the bath water" comes to mind in this regard. While ESC is most certainly a vital part of the economic infrastructure for the region, the team that supports ESC here is an equally vital part of our national defense, an important contributor to the future economic growth of the Nation.

I want to impress upon you the importance of Team Hanscom beyond the perspective of DOD. The transfer of technology from defense to nondefense has tremendous potential for our Nation. The technology we call C4I, which was developed by the ESC, has



opened numerous opportunities to improve our Nation's infrastructure. One example is the Law Enforcement Information System, LEIS, which our company developed for the U.S. Coast Guard.

This innovative system enables the Coast Guard to use high technology communications, the type pioneered and refined by ESC, for drug interdiction and other crucial law enforcement activities. The system was so successful it won the 1994 Federal Technology Leadership Award, only one of the 30 federally funded programs to be so honored last year.

This system, with its inter-operability and incredibly fast response time, can serve as a national model for law enforcement information systems. I believe C4I will prove to be an enabling technology for many new systems in the future, systems that will benefit both the public and private sector. These benefits will include improved health care information systems, including telemedicine, which will make it possible to deliver highly specialized diagnostics to a remote location, saving many lives in the process.

In fact, our company is supporting a very important telemedicine task at Hanscom. We are helping ESC develop a telemedicine capability. That holds tremendous potential not only to save lives of military personnel on the battlefield, but also by utilizing the same communication and information technologies in the civilian sector can bring expert diagnosis to critically ill or injured patients anywhere in the country.

Imagine the benefit of telemedicine to a sick young child in remote Alaska, who could receive a life-saving diagnosis from specialists at Dana Farber Institute in Boston. Imagine those who are seriously injured in accidents where the first 60 minutes are very critical; providing physicians with correct information very quickly.

This has been made possible as we speak by what ESC has done locally, using the local technologies and companies. Speaking as a small businessman, Hanscom Air Force Base is vital to the future of our company and our region. The loss of such a corporate giant will have an extremely detrimental impact on all of us who are fortunate enough to call ESC our customer.

The cost to our Nation of disrupting the Team Hanscom infrastructure will be, in my opinion, extremely high, including the possibility of exposing our forces in the future to risks that may have been mitigated by superior technology. Team Hanscom took 50 years to build. It will not be rebuilt overnight or without serious disruption and high cost if it were to relocate.

Team Hanscom enhances military readiness and rapid deployment, and this was proven in Desert Shield and Desert Storm. The air war in the Gulf, supported by technology developed by Team Hanscom, may have saved thousands of lives, if not tens of thousands of lives. I am so confident in our region's capability to support the needs of our Nation's C4I rather than relocating Hanscom to another part of the country, I suggest DOD consider relocating and consolidating all DOD's C4I activity at Hanscom Air Force Base. This plan offers economy, without compromising risk, and helps preserve the national asset, which is Team Hanscom.

The U.S. Air Force and ESC has been an important part of our success. Its loss to our region will place us and other ESC contractors on uncharted waters. Will our contracts remain in effect, or

will they be canceled or seriously modified should it move? Will we have an opportunity to relocate personnel to the ESC new locale? Who will bear the cost? How many of these uniquely skilled personnel will choose to go? If many decline due to the uncertain climate within DOD, can they be replaced? Will new facilities and adequate infrastructure exist in the new location to support the influx of ESC, its supporting cast and their families? What will the cost of doing business be in the area that might be on the seller side of a demand market? How will these dynamics impact costs to contractors and ultimately to the taxpayer public?

These questions weigh heavily on my mind today and I suggest these are the questions that must be considered by all, small businesses, large businesses, the DOD and the Congress.

In closing, Mr. Chairman, I urge you and your committee to recommend that Hanscom Air Force Base remain here in Massachusetts. Team Hanscom is an investment that pays dividends to the Nation year after year. Good managers, which all of you are in Congress, protect those investments and assets. I can think of no more important investment that the safety our Nation and the lives and of no asset more valuable than the unique high technology partnership that exists here between business, education, research and development, and Federal Government at Hanscom.

I urge you to do all you can to preserve this vital and proven capability for our Nation. I thank you for the opportunity given to me today and I will be open to any questions you may have.

[Mr. Desai's statement may be found in the appendix.]

Chairman TORKILDSEN. Thank you, Mr. Desai, for your testimony. Ms. Bondoc.

#### **TESTIMONY OF VICTORIA BONDOC, PRESIDENT AND CEO, GEMINI INDUSTRIES, BEDFORD, MASSACHUSETTS**

Ms. BONDOC. Good morning. I think the perspective that I would like to bring to you today in this hearing is that of an individual building and running a company that is significantly smaller than I think the other individuals here today. Gemini Industries, the company that I started in 1986, has roughly 75 full-time employees located both here in New England, as well as other States across the United States.

When I started the organization, on day number one, in 1986, and it was just me and the business cards, I think it was no surprise that the work that we were going to be pursuing would initially be me working the job, as well as trying to build the business and trying to get all the bills paid and everything else.

As our organization continued to grow and grew as a result of me working very closely with the Small Business Office at Hanscom Air Force Base, I think it's important to note that until 1993, 75 percent of my staff was not located in the New England area. I believe this to be because of the limited opportunities for Federal contracting here in the local area.

As a result of our efforts in providing engineering support to streamline operations, we were able to demonstrate to some of our customers that we could come up with systems designs that would only cost 1/10 of what their originally projected budget was and,

therefore, were able to build our credibility both with those organizations, as well as here at Hanscom Air Force Base.

Today, of the 75 people within my company, we've totally turned it around. 75 percent of our organization or over that are now located here within the New England area and a third of the company as a whole are supporting projects at Hanscom Air Force Base.

I think if you want an answer to the question what would the impact be of a base closure on our organization, all you would have to do is take the story that I just told you of our growth and pay it backwards and that's exactly what would happen to us. We do not have the financial resources and the contract base to try to re-assign those individuals or relocate them easily. I think it would definitely be a very serious impact and threat to the continued growth of our organization.

I also feel that it seems to me to be inconsistent that the Federal Government has been looking at ways of becoming less bureaucratic, less complex, and be more focused toward the entrepreneurial focus and if the threat and the impact of a lot of these actions are going to be to eliminate those same entrepreneurs that you're supposed to be focusing on, I don't feel as though we're really going in the right direction.

Thank you very much for giving me the opportunity to speak today and I'll be happy to continue to work with your organizations and to give you whatever information you need.

[Ms. Bondoc's statement may be found in the appendix.]

Chairman TORKILDSEN. Thank you, Ms. Bondoc. I'd like to thank all the witnesses for their testimony on the role that Hanscom plays for all of your small businesses, both for technology, which certainly is key to the mission of Hanscom, but also for support services, which everyone knows you can't possibly have any entity survive without first rate professional support services, as well.

I'd like to turn it over to Congressman Meehan, if you have any questions.

Mr. MEEHAN. A couple of questions. I was interested in some of the comments relative to dual use technology programs. As many of you may know, the Federal Government made a significant investment in dual use technology and ARPA programs and I've talked with many businesses in Massachusetts who have been able to make use of those programs.

I'm wondering if any of you have made use of any of the ARPA Programs or dual use technology programs, and, if so, what your experience was.

The other issue is in addition to this whole Hanscom issue, I'm interested in what types of initiatives the Federal Government ought to be undertaking to help this cutting edge technology, aside from keeping Hanscom open, which obviously is all of our first and foremost here today and will be first and foremost not only on March 1, but beyond. As we heard from the Secretary of the Air Force, this is a battle that we're going to be fighting. We're not going to take any chances after March 1 either and we're going to continue the process.

I would also congratulate all the people who are here because one of the interesting things about this process is it really has



brought the community together. Congressman Torkildsen and I, who are on the Small Business Committee, are constantly looking for ways that we can provide and encourage high tech development, cutting edge technology.

I'm interested in any ideas that you would have. Let me give you a couple of examples. Proposed cuts in capital gains tax cuts. I've proposed maybe investment tax credits. I'm interested and I have a theory that too many Members of Congress don't get involved with what makes companies like yours tick and how we can help grow, because your companies are the future.

I'm wondering if you would comment on ARPA and what initiatives we ought to be undertaking.

Mr. DESAI. ATSRC, Systems Resources Corporation, we have no ARPA program as such. However, we have used many programs at Hanscom, as well as the Federal Aviation Administration and technology transfer to the private civilian agencies. We have been able to do that very well.

In terms of what can be done, I believe that the Government must expand the technology transfer programs, where a lot of people can access it. I don't believe there is enough—that program is big enough for everybody to access it. The second thing is in terms of capital access, which you brought up, I have been a firm believer in the Government giving incentives to capital investments rather than the subsidies. I, for one, do not believe in subsidiaries as much as I would want a tax capital—reduction of capital gain taxes substantially so that people would invest in small businesses, because they are also partly taking the risk.

Mr. MEEHAN. How do we ensure that that happens? How do you frame it so that you ensure that that happens? In other words, there's been a lot of proposals in Washington for across-the-board capital gains tax cuts, which, frankly, I don't know, if you're looking at balancing the budget in 7 years, I'm not sure that we can do it, but how do you target it? What would your companies need in terms of targeting it?

Mr. DESAI. I am not sure how, because I have not formulated my own thoughts on that. We have just started thinking about some of the capital needs to expand our business. One way to do it would be to let people invest in small businesses with X number of years, minimum they have to keep the money, and the reduction in the capital gain is proportionate to how many years they keep. That's one formula.

The definition of small business is very tough to do in a witness stand because it's a relative term, and I think that's another area that one needs to work at. My belief is that by doing that, there will be venture capitalists, as well as other people, who will put money and they will find their way around.

Mr. HENDERSON. On your first question of ARPA support, we certainly have been the benefactor of ARPA support from the standpoint of funding our test facility at the Port of Tacoma. We also are the benefactor of a BAA, broad area announcement, which was for technology development as it relates to mobile x-ray systems, inspection systems for the southwest border.

We are in the middle of that project and we're about to start a fairly large engineering development model of a system we've de-



signed that I think will also have some terrific commercial applications both here in the U.S. and around the world, because inspection of cargo crossing a lot of different borders is a big issue around the world, with a lot of other countries. So, we found ARPA to be very supportive and very willing to listen to new ideas and new technologies.

The area that we have not participated in is the dual use technology program. The reason for that is that when a small business looks at the ARPA Program and what's required, when you look at making an equal investment, a lot of times that's a very impractical thing for a small business to consider doing given the control of overheads and the competitive nature of the business we're in.

There ought to be a better way to encourage small business participation in the dual use world as opposed to where ARPA and you are making the same investment. Since you can't use work in kind or previous work that you've done as your part of the contribution, it would be nice if there was some thought given to modifying the rule as it applies to that program, as it applies to small business and some accommodations you might make.

I think from a large business point of view, it's a terrific program. It supplements the IR&D Program of a large company. In many cases, with a small company with a good idea, economically, you just can't afford to do it. But on the other hand, we've certainly found ARPA is a very supportive environment.

On the other issue, we certainly support whatever can be done in the world of capital gains. I think you do need some strings on it to benefit small business. I think that's an absolute necessity. I also believe anything you do for a tax break for a capital investment also directly impacts small business and what they can do and what they can afford to do and risks that you can take in developing technologies.

Mr. MEEHAN. Thank you.

Chairman TORKILDSEN. Anyone else? Mr. Mei?

Mr. MEI. I would like to say a couple of things about transfer of technology. We have done some when we transferred multimedia training from training military guard dogs to training people for the telephone company. So, that's a successful transfer of technology.

However, the program, the TRP Program, for example, I just wanted to add a little bit to what Jim was saying. You could bring work in kind toward your part of the contribution, but when they evaluate your proposal—and we were told at these conferences, and it was very disappointing to me, was that they place a lot more value on risk money. That is, you must bring risk money—risk money is a lot more than work in kind.

So, for a company like us, a kind of medium size small business, our revenue is only \$26 million a year and you can take a little bit of that as the profit. What can we bring in? I went up and I talked to the person who was running the company. I think he was heading the program at the time. He said that's just the way the law is written, too bad. So, the TRP is not helping small businesses at all.

Mr. MEEHAN. Have you ever noticed the way Members of Congress blame the bureaucrats and the bureaucrats blame Members of Congress?

Mr. MEI. I seldom see that. About the tax cut on capital investments, I'm not sure how that would help small businesses. I remember one year when we were at about \$8 million in sales, somebody pointed out that we were paying more income tax than General Electric.

Chairman TORKILDSEN. Thank you, all of you, for those of you who responded to that question. Dr. Mei, certainly, given your comment between Members of Congress and bureaucrats, you could always branch out into diplomacy as well.

Just very quickly. For the contracting process in general, do you see ways that it could be improved? Do you find yourselves duplicating work between DOD contracts, which for many of you will be the bulk of your contracts with the Federal Government? Is it easy to branch out to other Government contracts once you've begun with the Defense Department? Could you just comment in general on that process, as you see it?

Mr. HENDERSON. I think one of the interesting things about—and I will use my company as an example, having started here at Hanscom and have had the opportunity to now work at a number of other Government installations around the country.

The set of skills that one has developed here at Hanscom, whether it be in some specialty engineering, we have used that as a platform to bid and win contracts in other locations. So, I think there is a natural progression. As you develop skills and as you expand that skill mix in a supportive environment like Hanscom, you can use that skill mix to bid jobs in other locations and build the business based upon the expertise you're developing here.

So, I think in one direct response to your question, from a contracting point of view, I think once you've been through the process here and you understand how to respond to proposals, you understand how to bid jobs, it's a great foundation to expand to other locations within the Federal Government.

Chairman TORKILDSEN. Would anyone else like to comment on that question?

Mr. DESAI. I think Jim is very right. We got our major first contract here as a defense contractor. We learned a lot from it. We have diversified since then and we have gone into FAA, Coast Guard, as well as the private sector.

I think some of the DOD and ESC in particular here have taken a leadership position in small business support, especially as you can see the numbers this morning. It's mind boggling how much they have done locally. I wish there were more civilian agencies that could be doing that. I think that would help small businesses.

The TRP Program could be also such that it is more supportive of small business. I don't think it's sort of set up for it. If you notice, the first round of award, the second I haven't seen, so I'm not sure, there were a lot of large institutions in it versus small businesses, and that may be indicative of what you could do there.

Chairman TORKILDSEN. I understand.

Ms. BONDOC. Just to add to what we've talked about here on the issue of contracting with the Federal Government, I agree that

many of the requirements and the forms and the paperwork, if you will, are the same and having developed the skill base, it transfers from one agency to the other.

The penalty that a small organization like mine pays is the administrative process of filling out and re-filling out the same forms to a variety of different agencies that may be named different things, that may, in fact, be the same form. But, for example, perhaps you are submitting two different proposals to the same agency and, in a sense, you're filling out the same forms three or four times, which, when you have a large organization, maybe you have more than one person, different sets of people working those efforts.

When you have a small organization, you've got the same person filling out forms eight or nine times. Perhaps if we were to move closer in the age of automation in some sort of computerization of this where more and more of this information is maintained on a computer, one does not anymore have to take as much administrative overhead completing and submitting the different forms.

Chairman TORKILDSEN. If anyone else wishes to testify? Otherwise, I will just conclude and I'll say thank you for all of your testimony on the role that Hanscom plays in each one of your small businesses. Clearly, you represent many small businesses in the area that depend upon that, but also many small businesses that contribute significantly not only to the success of Hanscom, but the more important objective, and that's the defense of our country.

So, thank you for your testimony. Before we adjourn, I also want to thank our host for the hearing today, Post 221 here in Bedford, for making their hall available to us. The transcript of these hearings will be available I believe in a few weeks, for people who are interested. The hearing is adjourned. Thank you.

[Whereupon, at 12:10 p.m., the subcommittee was adjourned, subject to the call of the chair.]

## APPENDIX

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### STATEMENT OF HON. PETER G. TORKILDSEN, CHAIRMAN, GOVERNMENT PROGRAMS SUBCOMMITTEE, IN CONNECTION WITH A HEARING ON THE IMPACT OF HANSCOM AIR FORCE BASE UPON SMALL BUSINESS IN THE NEW ENGLAND REGION

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Mr. TORKILDSEN. The subcommittee will come to order. I would like to start by thanking our witnesses, especially Governor Bill Weld, for joining us here today.

The purpose of this hearing is to examine the impact of Hanscom Air Force Base upon local and regional small business. This is not a BRAC hearing. The Small Business Subcommittee on Government Programs, which I chair, has jurisdiction over the Small Business Act and is designed to assist small businesses in their dealings with Federal government contracts. Today's findings will be shared with the full Small Business Committee. The transcript of today's hearing will also be available for any future use on the importance of Hanscom AFB to the people of New England.

Hanscom has been key in sustaining Massachusetts' economy. Small firms have been a significant beneficiary of Hanscom's presence. The prospect of shutting down entirely should be of great concern to everyone.

We have a number of small business success stories in this room here today. Our panel of witnesses includes risk-takers and entrepreneurs who started companies with limited resources. These same individuals now own and manage thriving businesses which have provided jobs and growth to a region which has faced many economic challenges.

Six years ago Massachusetts entered a recession. Between 1989 and 1992, the state's economy was particularly hard hit and Massachusetts lost a large percentage of its total jobs, including defense, manufacturing and high-tech. However, during this same period, jobs in the small business sector grew.

To say that small business would suffer without Hanscom is an enormous understatement. Obviously the high-tech firms that directly contract with Hanscom would be devastated. But a negative ripple effect would extend much further. For example, many traditional "Mom and Pop," main street-type businesses, such as family-owned restaurants, convenience stores, dry cleaners and flower shops, would be adversely affected. Such entities rely on



Hanscom's direct and indirect workforce.

However, Hanscom's importance cannot merely be assessed on an economic basis. Hanscom is first and foremost critical to our national security. It has been credibly said that the war in the deserts of the Persian Gulf was won in the laboratories of Hanscom. Electronic Systems Center innovations made it possible for allied commanders to apply "smart" weapons with deadly accuracy against the enemy, severely curtailing the costs of the operation in terms of American lives and dollars. The results were simply awesome.

During the past 30 years, the Air Force has systematically assembled its finest brain power at Hanscom, forming a synergistic research and development complex which ties together many contributing elements. The Electronic Systems Center is supported by diversified R & D components including MITRE Corporation, Lincoln Laboratory, and the Phillips Laboratory-Geophysics Directorate. These entities, in turn, work directly with an array of prestigious academic institutions including the University of Massachusetts, Harvard University, MIT, Boston University, Northeastern University, and others. And supporting this is a large number of private companies whose contributions to research and product development have made Route 128 famous around the world.

The economic impact of Hanscom Air Force Base is staggering. The installation is the fourth largest employer in Massachusetts with 11,500 direct jobs, and another 19,800 indirect jobs. The direct payroll alone is \$653 million annually.

Approximately \$600 million per year flows from Hanscom to local universities and non-profit research centers, with another \$400 million paid annually for the services of local companies. The total impact on the New England economy is \$3.2 billion per year.

I would like to commend the "Team Hanscom" representatives who have been relentless in their efforts to educate the citizens of New England, and the decision-makers in the Pentagon, regarding the importance of Hanscom AFB. I will now yield to my friend and colleague from Massachusetts, Congressman Meehan, the ranking minority member of the Small Business Subcommittee on Tax and Finance, for any comments he wishes to make at this time.

*Gemini  
Industries  
Inc*

54 Middlesex Turnpike, Bedford, MA 01730 (617) 271-0007 • FAX (617) 271-0195

TESTIMONY  
on  
THE EFFECTS OF  
HANSCOM AFB OPERATIONS ON SMALL BUSINESSES IN THE REGION  
of the  
SMALL BUSINESS SUBCOMMITTEE ON GOVERNMENT PROGRAMS  
by Victoria R. Bondoc  
February 13, 1995

Good morning Mr. Chairman and members of the Subcommittee. I am Victoria Bondoc, President and CEO of Gemini Industries, a small defense contracting company which I started in 1986. My company specializes in providing technical and management support services to the Department of Defense, Department of Transportation and a variety of other Government agencies as well as private industry. The company has grown over the years to over 70 employees in Massachusetts, Virginia, Alabama and Texas.

Since 1993, I have been actively involved in promoting the interests of small and emerging businesses. I currently serve on the Small Business Council of the U. S. Chamber of Commerce, the NASA Minority Business Resource Advisory Council and the Executive Board of the Young Entrepreneurs Organization Boston Chapter. Because Gemini specializes in helping organizations reengineer processes and systems to streamline operations and more readily initiate and manage change, I support Vice President Gore's *Reinventing Government* initiative participating in the White House Conference on Small Business, testifying before the House Committee on Procurement, Taxation and Tourism and speaking at Government/Industry Information Technology Forums. I am particularly pleased to present our perspective on the effect of Hanscom operations on small businesses.

Due to the large number of defense contractors in the local area, establishing credibility at Hanscom AFB in Massachusetts has been a slow process which extended over a six year period. Early contracts involved only 3 engineers providing software, communications and information system engineering to the upgrade of systems within and supporting the Cheyenne Mountain. Although Gemini steadily grew, prior to 1993, over 75% of the staff and business base was located outside of New England. On more than one occasion, we considered relocation of our corporate headquarters to reduce cost and facilitate operations.

Gradually our efforts at Hanscom AFB supporting tenant organizations as well as the Electronic Systems Center have continued to grow as the achievements of Gemini's engineers, system analysts, physicists and management consultants were recognized in the *Blue Chip Enterprise Initiative Award* for small business excellence, the *Small Business Prime Contractor of the Year* at the Department of Transportation Volpe Center in Cambridge, Massachusetts and the Small Business Administration *Administrator's Excellence Award*. Today, local efforts comprise over 75% of the company's total business base.

Over 50% of our local staff directly support projects at Hanscom AFB. The closing of Hanscom would represent a significant loss in investment of a small company and risk to continued health and growth. Such an action may result in job loss for 23 engineers, scientists, analysts and support personnel. Such an action involves limited opportunity for reassignment of personnel and growth given an already limited range of opportunities in the local area.

Such an action poses a serious threat to a small business. It is from the small business community that the Government can observe and derive techniques that will allow a return of the entrepreneurial focus and reduction in complex processes and paperwork targeted under initiatives such as *Reinventing Government* and *Paperwork Reduction*. The elimination of small businesses that could result from the closing of Hanscom seems to be inconsistent with this objective.

Thank you for the opportunity to testify before you on this very important subject. I look forward to working with you over the coming months to outline and measure the effects of Hanscom AFB on the local small business community.

**STATEMENT OF  
COLONEL KEN COLLINS**

Good morning. I'm Colonel Ken Collins, Director of Quality Initiatives and Strategic Planning for the Electronic Systems Center at Hanscom Air Force Base. My presence before your subcommittee today is two-fold. First, to act as a command representative and assure you that the Electronic Systems Center and Hanscom are committed to working with small businesses in the region. As you will hear in our presentation, we find our interaction with small business to be advantageous, not only in the economic impact to the area, but also to our command and the Air Force in the production of the world's finest command, control, communications, computers, and intelligence systems.



Second, I want to introduce the gentlemen who will provide you with the facts on Hanscom and small business. Captain Shannon Sullivan, Chief of our Special Projects Office, will make the presentation, and Mr. Al Hart, Director of our Small Business Office is available to answer your questions. And now I will turn it over to Captain Sullivan.

ORAL TESTIMONY OF  
SAMIR A. DESAI  
TO THE  
SMALL BUSINESS SUBCOMMITTEE ON GOVERNMENT PROGRAMS,  
HEARINGS ON THE ECONOMIC IMPACT OF HANSCOM AFB  
UPON SMALL BUSINESSES  
FEBRUARY 13, 1995

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Good Morning Mr. Chairman and members of the subcommittee. My name is Samir A. Desai. I am the president and founder of System Resources Corporation (SRC), which is headquartered in Burlington, Massachusetts. My company is classified by the U.S. Small Business Administration (SBA) as a "small business".

I appreciate the opportunity to appear before you today and offer my views on Hanscom AFB and its economic impact on small business. I believe my company is representative of the small businesses in Massachusetts that support the many important programs managed by the U.S. Air Force, Electronic Systems Center (USAF/ESC) headquartered at Hanscom AFB.

Our company provides the following services to customers in the public and private sectors:

- C<sup>3</sup>I (Command, Control, Communications, Computer, and Intelligence Systems)
- Information Systems and Related Services
- Technical, Management and Logistics Support
- Applied Research and Development, and
- Technology Transfer

SRC employs approximately 400 full-time personnel, about 80 of whom work at Hanscom AFB supporting programs that include:

- 1) Joint STARS (Joint Surveillance Target Attack Radar System)
- 2) AWACS (Airborne Warning and Control System)
- 3) Mission Planning
- 4) AWDS (Automated Weather Distribution System)

In addition to our own personnel, our Hanscom contract supports an additional 35 employees via our subcontracting activity.

In order to keep my remarks within the time allocated today, I will summarize from my written testimony, which has been submitted for the record.

The R&D and technological advancements for which ESC is internationally renowned are not products of a single organization, they are the fruits of a region that is home to some of the world's most prestigious universities and R&D centers. Our region possesses unique capabilities and resources, an infrastructure that has been built and nurtured over 50 years. The term "Team Hanscom" is more than a rallying cry, it is a statement of fact. The expression, "*DON'T THROW THE BABY OUT WITH THE BATH WATER*", comes to mind in this regard. While ESC is most certainly a vital part of the economic infrastructure of our region, the team that supports ESC here is an equally vital part of our national defense, and important contributors to the future economic growth of the nation.

I want to impress upon you the importance of Team Hanscom beyond the perspective of DoD. The transfer of technology from defense to non-defense has tremendous potential for our nation. The technology we call C<sup>4</sup>I, which was developed by the ESC, has opened numerous opportunities to improve our nation's infrastructure. One example is the Law Enforcement Information System (LEIS), which our company developed for the U.S. Coast

Guard. This innovative system enables the Coast Guard to use high-technology communications, the type pioneered and refined by ESC, for drug interdiction and other crucial law enforcement activities throughout the country. This system was so successful, it won the 1994 Federal Technology Leadership Award, only one of 30 federally funded programs to be so honored last year. This system, with its inter-operability and incredibly fast response time can serve as a national model for law enforcement information systems.

I believe C<sup>4</sup>I will prove to be the enabling technology for many new systems in the future, systems that will benefit both the public and private sectors. These benefits will include improved healthcare information systems, including telemedicine, which will make it possible to deliver highly specialized diagnostics to remote locations, saving many lives in the process. In fact, our company is supporting a very important telemedicine task at Hanscom. We are helping ESC develop a telemedicine capability that holds tremendous potential not only to save lives of military personnel on the battlefield, but, also, by using the same communications and information technologies in the civilian sector, can bring expert diagnoses to critically ill or injured patients anywhere in the country. Imagine the benefits of telemedicine to a sick young child in remote Alaska who could receive a life saving diagnosis from a specialist at Dana Farber Institute in Boston. Imagine those seriously injured in an accident and the importance of treatment during the so called "golden hour", the critical first 60 minutes that may determine life or death. C<sup>4</sup>I technology can bring the best medical minds to bear on any problem, anywhere, in virtual real-time. ESC has already demonstrated a successful cross-country transmission of high resolution imagery of the type needed to successfully transmit and



remotely diagnose X-rays and Cat Scans. Team Hanscom companies created the technologies that make it all possible, technologies developed by indigenous companies and institutions.

Speaking as a small businessman, Hanscom AFB is vital to the future of our company and our region. The loss of such a "corporate giant" will have an extremely detrimental impact on all of us who are fortunate enough to call ESC our customer.

The cost to our nation of disrupting the Team Hanscom infrastructure will, in my opinion, be extremely high, including the possibility of exposing our forces in the future to risks that may have been mitigated by superior technology. Team Hanscom took 50 years to build. It will not be rebuilt overnight or without serious disruption and high cost. Team Hanscom enhances military readiness and rapid deployment, and, as proven in Desert Shield and Desert Storm, helped create the most superior military technology the world has known. The air war in the Gulf, supported by technology developed by Team Hanscom, may have saved thousands of lives, if not tens of thousands.

I am so confident in our region's capabilities to support the needs of our nation in C<sup>4</sup>I, rather than relocate Hanscom to another part of the country, I suggest DoD consider relocating and consolidating all DoD C<sup>4</sup>I activities to Hanscom AFB. This plan offers economies without compromising risks, and helps preserve a national asset....Team Hanscom!

The USAF/ESC has been an important part of our success. Its loss to our region would place us and other ESC contractors on unchartered waters... Will our contracts remain in effect or will they be cancelled or seriously modified? Will we have an opportunity to relocate personnel to the new ESC locale? Who will bear the cost?

How many of these uniquely skilled personnel will choose to go? If many decline, due to an uncertain climate within DoD, can they be replaced? Do facilities and an adequate infrastructure exist in the new location to support the influx of ESC, its supporting cast and their families? What will the cost of doing business be in an area that might be on the seller's side of a demand market? How will those dynamics impact cost to contractors, and, ultimately, the taxpaying public? These questions weigh heavily on my mind today. I suggest these are questions we all must consider....small business, large business, the DoD and Congress...

In closing, Mr. Chairman, I urge you and your committee to recommend that Hanscom AFB remain here in Massachusetts. Team Hanscom is an investment that pays dividends to the nation year after year. Good managers protect their investments and assets. I can think of no more important investment than the safety of our nation and allies, and of no asset more valuable than the unique high-technology partnership that exists here between business, education, research & development, and the federal government. I urge you to do all you can to preserve this vital and proven capability for our nation.

Thank you, Mr. Chairman, I appreciate your kind attention and would be pleased to answer any questions you have.

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1. "Choosing to Compete. A Statewide Strategy for Job Creation and Economic Growth," A Report by the Comm. of Massachusetts, p7., circa 1993
2. "Hanscom Air Force Base", A USAF/ESC Presentation, 1994, p. BL-2/64.

## REMARKS

JAMES W. HENDERSON  
CEO AND PRESIDENT  
ANALYTICAL SYSTEMS ENGINEERING CORPORATION

THANK YOU FOR THE OPPORTUNITY TO SPEAK AS A SMALL BUSINESS EXECUTIVE AND AS A FOUNDER OF TEAM HANSCOM. I WANT TO THANK THE DELEGATION FOR THE STRONG SUPPORT IN MAKING THE CASE FOR THE ELECTRONIC SYSTEMS CENTER AND HANSCOM AIR FORCE BASE. MANY IN THE MILITARY HAVE THE PERCEPTION THAT MASSACHUSETTS IS NOT A FRIENDLY, SUPPORTIVE ENVIRONMENT. I BELIEVE THAT IMAGE HAS BEEN DISPELLED BY THE BIPARTISAN COOPERATION AND RESOLVE TO DEFEND THE BASE. THE \$100 M BOND BY THE GOVERNOR, THE PRESENTATION TO SECRETARY WIDNALL, AND THIS HEARING TODAY DEMONSTRATE A REAL COMMITMENT TO THE CRITICAL ROLE THAT THE ELECTRONIC SYSTEMS CENTER PLAYS IN THE TECHNOLOGY ALLIANCE OF EASTERN MASSACHUSETTS.

ELECTRONIC SYSTEMS CENTER AND HANSCOM AIR FORCE BASE HAVE ALWAYS BEEN LEADERS IN INCLUDING SMALL BUSINESS AS FULL PARTICIPATING PARTNERS. MY COMPANY HAS BEEN A CONTRACTOR AT HANSCOM AFB FOR OVER TWENTY YEARS. IN FACT, OUR FIRST CONTRACT WAS FOR A PROJECT AT HANSCOM. THEY WERE WILLING TO TAKE A CHANCE ON A VERY SMALL COMPANY. IN 1978, WE WON OUR FIRST LARGE SMALL BUSINESS SET ASIDE PROCUREMENT - IT WAS HERE AT HANSCOM AFB. IT WAS FOR 70 MAN YEARS PER YEAR OF SYSTEMS

INTEGRATION SUPPORT FOR THE DEPARTMENT OF DEFENSE PHYSICAL SECURITY PROGRAM. AS A PART OF THIS PROGRAM WE HELPED DESIGN THE SYSTEM USED TO VERIFY MISSILE PRODUCTION AT TWO SOVIET PLANTS UNDER THE INF TREATY. THE SYSTEM USED X-RAY TECHNOLOGY TO EXAMINE RAILROAD CARS TRANSPORTING MISSILES FROM THE PLANTS. THE UNITED STATES WAS NOT ALLOWED TO OPEN THE RAILROAD CARS BUT HAD TO RELY ON AN X-RAY IMAGE FOR VERIFICATION. THIS EXPERIENCE LED US TO LOOK FOR COMMERCIAL APPLICATIONS OF THE INSPECTION TECHNOLOGY. A LONG STANDING PROBLEM IN THE UNITED STATES IS INSPECTION OF SHIPS' CONTAINERS. FEW CONTAINERS ARE INSPECTED. ONE CONTAINER MAY REQUIRE 8 HOURS TO BE MANUALLY INSPECTED. A TEN PERCENT MANUAL INSPECTION RATE WOULD STALL COMMERCE. WE, AS A SMALL BUSINESS AND AT OUR OWN EXPENSE, SET UP A DEMONSTRATION FACILITY TO SHOW THE VALUE TO CARGO INSPECTION. ARPA VISITED THE FACILITY AND BASED ON THEIR EVALUATION OF OUR RESULTS FUNDED OUR MOVING THE SYSTEM TO THE PORT OF TACOMA TO AN OPERATIONAL SETTING. DURING THE PAST YEAR OF TESTING, THE SYSTEM WAS SUCCESSFUL IN IDENTIFYING OVER 90% OF THE CONTRABAND HIDDEN IN THE CONTAINERS USING THE X-RAY IMAGE ENHANCED BY THE SYSTEM SOFTWARE. CONTRABAND RANGED FROM DRUGS TO WEAPONS. UP TO 30 CONTAINERS PER HOUR COULD BE INSPECTED WITH ONE SYSTEM VERSUS ONE CONTAINER PER 8 HOURS USING MANUAL INSPECTION. WE BELIEVE THAT THIS SYSTEM SHOULD BE INSTALLED AT ALL MAJOR PORTS AND BORDER CROSSINGS. IT WOULD REDUCE MANIFEST CHEATING, CONTROL TECHNOLOGY TRANSFER AND PUT A ROAD BLOCK IN THE DRUG TRAFFIC. I BELIEVE



THAT THIS DEMONSTRATES A SUCCESSFUL TECHNOLOGY TRANSFER FROM A DOD PROJECT TO A COMMERCIAL APPLICATION. IT HAPPENED HERE AT HANSCOM AFB. THE INDIRECT BENEFITS TO THE SMALL BUSINESS COMMUNITY WITH ITS RELATIONSHIP TO THE ELECTRONIC SYSTEMS CENTER ARE DIFFICULT TO MEASURE. MY EXAMPLE OF THE INSPECTION SYSTEM WOULD NOT SHOW UP IN ANY STATISTIC. IF THE ELECTRONIC SYSTEMS CENTER HAD NOT BEEN A SUPPORTIVE ENVIRONMENT FOR SMALL BUSINESS, WE WOULD NOT HAVE BEEN ABLE TO EXPAND OUR BUSINESS BASE TO OTHER LOCATIONS WITHIN THE DEPARTMENT OF DEFENSE. WE GOT OUR START HERE AT HANSCOM AFB.

IF THE ELECTRONIC SYSTEMS CENTER WERE TO MOVE, I BELIEVE THERE ARE OVER 1,000 SMALL BUSINESS DIRECT JOBS THAT WOULD BE EFFECTED IN THE LOCAL AREA. SMALL BUSINESSES WOULD TAKE A MAJOR HIT. BEYOND THE DISRUPTION TO THE SMALL BUSINESSES, A SIGNIFICANT PART OF THE SYSTEMS ENGINEERING AND INTEGRATION TALENT THAT SUPPORTS THE TECHNOLOGY KNOWLEDGE BASE WOULD BE LOST IN THE MOVE. THE FOSTERING ENVIRONMENT WOULD BE LOST THAT HAS PRODUCED A VIBRANT SMALL BUSINESS COMMUNITY. I BELIEVE THAT SMALL BUSINESS HAS BEEN AN INTEGRAL PART OF THE FABRIC THAT HAS PRODUCED WORLD CLASS C4I SYSTEMS AT HANSCOM AFB. I AM PROUD OF THE CONTRIBUTION THAT SMALL BUSINESS HAS MADE TO THE MISSION OF THE ELECTRONIC SYSTEMS CENTER. IT WOULD BE A MAJOR STEP BACKWARDS FOR SMALL BUSINESS IN MASSACHUSETTS TO LOSE THE RELATIONSHIP.

THANK YOU FOR THE OPPORTUNITY TO SPEAK TO YOU TODAY.

Home address: 486 Autumn Lane  
 Carlisle, MA 01741

Thank you for inviting me to the hearing, today. I would like to discuss the history of my company, our relationship with Hanscom, how my company would be affected by a base closure, and my assessment on the economic impact on this area.

I immigrated to the United States in 1952. With the help of scholarships and part time jobs, I graduated from the Putney School in Vermont and received a Bachelor's degree in Mathematics from Harvard, a Master's degree in Mathematics from Brown, and a Ph.D. in Computer Science from Purdue. I entered the computer field in 1957. While still in college, I was hired for the summer by Honeywell, as a computer operator.

I started MeI Technology in my basement in 1975, but was not able to sustain the company. I tried again in 1980 and this time was successful. The company, then known as MeI Associates Inc., grew from one person to over 220 employees today, with revenues of \$26 million. The company has office locations in different parts of the country; however, more than half of the employees are in our Lexington and Bedford, Mass. facilities.

MeI Technology offers services in computer systems integration, software/hardware development, and engineering support to major Dept. of Defense and Dept. of Transportation programs. We have a senior, well-educated technical staff with degrees in the sciences and engineering. More than half possess advanced degrees. Hanscom is by far the company's largest single client accounting for over 60% of its revenue.

It did not start out that way. Recognizing a need at Hanscom for competent engineering support at reasonable prices, we painstakingly built a staff of engineers and scientists educated in fine local universities such as Harvard, MIT, Tufts, the University of Massachusetts and Boston University. Furthermore, we made use of the fine skills and talents of many retired, but still young Air Force personnel who could make measurable contributions to the Electronic Systems Center in a civilian capacity. As a result, our staff has the up-to-date technical and engineering knowledge to support Hanscom's unique requirements for developing sophisticated electronic systems for our national defense. Equally important, we possess sufficient knowledge of the intricate internal workings of the Air Force acquisition community to provide a very cost effective "privatized" high-tech service to support Hanscom's needs. This skillful melding of scientific and engineering expertise with operational and acquisition engineering talents is key to our success. MeI Technology has an impressive growth record. We're debt free, very competitive, and provide one of the best employee benefits packages available in the area.

A recent testament to the success of our business approach came when we won the 1994 Small Business Administration award of Prime Contractor of the Year for New England. In nominating MeI Technology for the award, the Electronic Systems Center at Hanscom stated that... "the company is respected by its customers, teammates, and competitors alike, for its work quality, business ethics, and financial strength. The company has earned a well-deserved reputation for delivering a quality product on time."

Following are some examples of major Hanscom programs on which Mei Technology engineers are performing combinations of analysis, design and development, reviews, test and evaluation, and manufacturing monitoring:

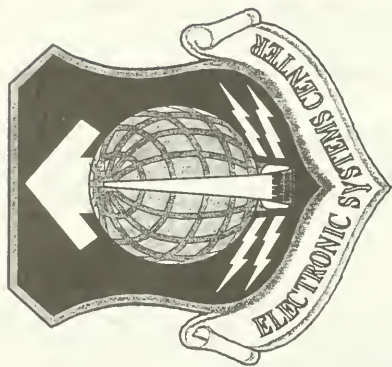
1. AWACS (Airborne Warning and Control System) - The AWACS aircraft is an airborne command post which identifies hostile aircraft and forwards warning information to other ground and airborne command centers.
2. Joint STARS (Joint Surveillance Target Attack Radar System) - Joint STARS is an airborne radar system which identifies enemy ground forces and passes the information to battle management centers. This system proved itself to be extremely effective during Desert Storm.
3. IDHS (Intelligence Data Handling System) - IDHS is a DoD-wide program for developing, fielding, and maintaining automated data processing systems for the management of intelligence information and the development of analytical tools.
4. CBRN (Caribbean Basin Radar Network) - CBRN is a set of radars and communications links around the Caribbean for drug interdiction.
5. TASS (Tactical Automated Sensor System) - TASS is a portable security system that can be rapidly set up to protect personnel and assets in the field.

If Hanscom closes or the Electronic Systems Center moves away, the impact to our company would be devastating. As you know, the high-tech industry is not expanding in this region. Therefore, there would be few opportunities for the company to quickly transfer the capabilities of the staff to work for commercial clients. I estimate that most of our Massachusetts employees will not have jobs and many of the people in our other offices will be affected, because a number of them work on Hanscom projects in conjunction with our local staff.

To relocate the staff would be far beyond the resources of this small company. While one may say that we deserve what we get because we should have diversified, a small business must go where the business is. It usually does not have the funds to do a great deal of internal R&D and product development to diversify its business base. We have built a unique capability to satisfy a market need. We have built a dedicated staff using the local talent unique to this region. I strongly believe that if Hanscom's electronics activities leave this region, the country will be losing a great deal of talent unique to this area of world class universities, laboratories, computer hardware and software firms, and developers of state-of-the-art electronic systems. Silicon Valley in California and the Massachusetts high tech industrial complex are world leaders in emerging state-of-the-art electronic products. Hanscom plays a key role in that industry.

Mei Technology is but a small firm with a monthly payroll of \$1 million. One may erroneously conclude that over one hundred people losing their jobs will not adversely impact the region. However, if we multiply the impact by the hundreds of firms, many of them small businesses like Mei Technology, that would be affected by losing Hanscom, one can appreciate the serious effect of the thousands of jobs that will be lost. More importantly, we would be losing a part of our competitive edge in the world of high tech electronics leadership.

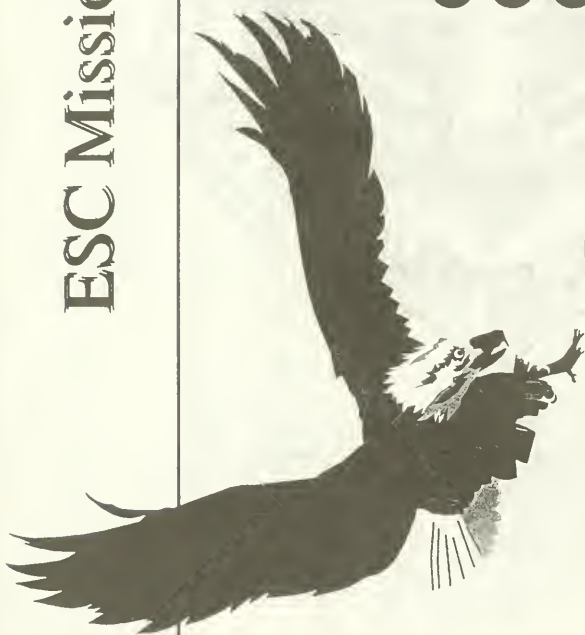
# Small Business and Hanscom AFB



**Capt Shannon Sullivan**  
**Special Projects Officer**



# ESC Mission



COMMAND  
CONTROL  
COMMUNICATIONS  
COMPUTERS  
INTELLIGENCE

4I  
C



# Overview

- Awards
- Small Business Contracts
- Teamwork
- Conclusion

# Award Winning Small Business Program

- Secretary of the Air Force Small Business Award eight of the past ten years
- Top Small Business Program in the Air Force
- Air Force Small Business Program Excellence Award for its FY92 performance
- Exceeded congressionally goal to small disadvantaged business five times in six years.



# Small Business Expertise

- Engineering Services - help in our acquisition function
- Intelligence Systems - integration of intelligence data systems
- C4I Systems Integration - e.g. mobile air traffic control system
- Research & Development - Rome and Phillips Laboratories
- Construction - base infrastructure
- Small Purchases - laboratory and office equipment
- Physical Security Systems - reducing police manning demands
- Travel Services - e.g. travel agent
- Base Maintenance Services - janitorial services, publications

# Small Business Expertise (estimated)

• Engineering Services	\$85M	34%
• Intelligence Systems	\$40M	16%
• C4I Systems Integration	\$40M	16%
• Research & Development	\$35M	14%
• Construction	\$20M	8%
• Small Purchases	\$18M	7%
• Physical Security Systems	\$5M	2%
• Travel Services	\$5M	2%
• Base Maintenance Services	\$2M	1%

# Small Business Obligations

<u>Year</u>	<u>Small Business</u>
FY94	\$254.3M
FY93	\$331.9M
FY92	\$310.3M
FY91	\$257.9M

# Small Business Obligations

<u>Year</u>	<u>Small Business</u>	<u>Small Disadvantaged</u>
FY94	\$254.3M	\$114.0M
FY93	\$331.9M	\$191.4M
FY92	\$310.3M	\$181.2M
FY91	\$257.9M	\$102.1M



# Top-10 Small Business Awards

FY94

Infotech Development, Inc.*	\$33.4M
Mei Technology*	\$18.9M
Sencom Corporation	\$16.2M
Assurance Technology Corporations	\$12.4M
Horizons Technology	\$11.9M
Systems Resources Corporation*	\$11.3M
Analytical Systems Engineering Corp.	\$11.3M
Abacus Technology*	\$10.2M
BTG Incorporated*	\$ 6.7M
Support Systems Associates. Inc.	\$ 6.5M

# Top-10 Small Business Awards

## Headquartered in Massachusetts

Infotech Development, Inc.*	\$33.4M
Mei Technology*	\$18.9M
Sencom Corporation	\$16.2M
Assurance Technology Corporations	\$12.4M
Horizons Technology	\$11.9M
Systems Resources Corporation*	\$11.3M
Analytical Systems Engineering Corp.	\$11.3M
Abacus Technology*	\$10.2M
BTG Incorporated*	\$ 6.7M
Support Systems Associates. Inc.	\$ 6.5M

# Top-10 Small Business Awards

Headquartered or working in Mass.

<b>Infotech Development, Inc.*</b>	<b>\$33.4M</b>
<b>Mei Technology*</b>	<b>\$18.9M</b>
<b>Sencom Corporation</b>	<b>\$16.2M</b>
<b>Assurance Technology Corporations</b>	<b>\$12.4M</b>
<b>Horizons Technology</b>	<b>\$11.9M</b>
<b>Systems Resources Corporation*</b>	<b>\$11.3M</b>
<b>Analytical Systems Engineering Corp.</b>	<b>\$11.3M</b>
<b>Abacus Technology*</b>	<b>\$10.2M</b>
<b>BTG Incorporated*</b>	<b>\$ 6.7M</b>
<b>Support Systems Associates. Inc.</b>	<b>\$ 6.5M</b>

# Key to a Successful Program

- **Top Management Support**
  - **Commander's Commitment**
  - **Supportive Environment**
  - **Small Business Part of Business Culture**
  - **Openness to Small Business Marketing**
  - **Stress Subcontracting to Major Primes**



# Hanscom Outreach

## One Stop Shopping

- **Small Business Office helps over 2,500 callers /visitors yearly**
  - How to market Hanscom and Electronic Systems Center
  - Identify end user of company's supplies and services
  - How to market federal government
  - Referrals to other agencies
- **Subcontracting Opportunities**
  - Subcontracting Opportunities Day
  - Award Fee
- **Learning the Ropes**
  - Program offices, laboratories and contracting personnel help companies new to contracting at Hanscom

# How Hanscom Benefits

- Cutting edge technology
- Small contractors more responsive and more focused
- Increased competition
- Lower prices from lower overhead rates
- Encouraging expansion of the technological base

# Conclusion

- The Hanscom/ESC mission is vital to the defense of the United States
- Massachusetts' Small Business is essential to completing the C4I mission





## Vining Disposal Service, Inc.

62W MONTVALE AVENUE  
STONEHAM, MASSACHUSETTS 02180  
(617) 279-0006

Industrial • Commercial • Residential

### HISTORY - VINING DISPOSAL SERVICE

Vining Disposal Service, one of the largest independent solid waste and recycling companies in the northeast has successfully grown from a small recycling and salvage operation begun by Richard M. Vining Sr. in 1946 to a multi million dollar company in 1995.

In 1972 Michael and David Vining expanded their father's business and focused on the collection and transportation of solid waste in the commercial area. Beginning with one truck and annual sales of \$24,000.00 the Vinings set out to establish a record of service at a fair price, and have been very successful. Today with a fleet of over 60 trucks and annual sales of 12 million, they service over 3600 commercial pick-ups in front and rear loading packers and another 350 roll-off containers per week. In addition to their commercial business the Vinings identified the need to grow in the municipal area. In 1980, beginning with one contract with the Town of Burlington, MA of 6,500 homes per week, they have now expanded their municipal involvement in excess of 100,000 homes per week. Some of the towns serviced are Andover, Burlington, Chelmsford, Maynard, Westford, Westwood and over the years many others. They have also handled the transfer station/recycling center needs of the towns of Weston and Orleans.

Again, in the mid 80's, the Vinings identified the future of not only Vining but the waste industry, to be in the waste reduction, through repackaging, reuse, recycling, and composting. Beginning a national search to educate themselves in the programs already established, the Vinings traveled the country picking and choosing various aspects of over 20 curbside collection programs to tailor one to this part of the country. In 1989 their efforts paid off as they began collection of recyclables for over 15,000 homes. To compliment this effort Vining also

established a processing center to receive, process, store and repackage recyclables for market. Vining, at its center, also does processing of source separated demolition and construction waste, enabling these materials to be recycled thereby avoiding the necessity of using landfills.

Vining, a company of vision in the 70's and the 80's, can be counted on to be a major player in the 90's, as the industry and the country goes from a wasteful society to one of reclamation and reuse.

DIRECT IMPACT

## \* LOSS OF CONTRACT TO SERVICE HANSCOM.

- REDUCTION OF 4.6 % OF GROSS REVENUES
  - APPROXIMATELY \$550,000.00 PER YEAR
- LOSS OF CAPITALIZATION OF EQUIPMENT PURCHASED TO SERVICE SAID CONTRACT.
  - APPROXIMATELY \$300,000.00 OF PURCHASED EQUIPMENT AMORTIZED OVER THE 5 YEAR LIFE OF THE CONTRACT - A LOSS OF \$5000.00 PER MONTH FOR EACH MONTH REDUCED IN THE LIFE OF THE CONTRACT.

INDIRECT IMPACT

1. A FURTHER DETERIORATION OF VINING'S COMMERCIAL REVENUE BASE BY EITHER ELIMINATION OR DOWNSIZING OF COMMERCIAL CUSTOMERS WHO ARE AFFECTED BY THE BASE CLOSURE.

A CONSERVATIVE ESTIMATE OF LOST REVENUES WOULD BE 20 %

2. THE POTENTIAL LOSS OF PROPERTY TAX REVENUES TO OUR MUNICIPAL CUSTOMER BASE COULD FORCE THOSE COMMUNITIES TO REDUCE SERVICES. HISTORY HAS SHOWN THAT ONE OF THE FIRST SERVICES TO BE REDUCED IS WASTE COLLECTION. MUNICIPALITIES REPRESENTS 28 % OF OUR GROSS REVENUES.

WE ESTIMATE THIS REDUCTION COULD BE AS HIGH AS 50 % OF THAT AMOUNT EQUATING TO ADDITIONAL LOST REVENUES OF 14 %

THE COMBINED DIRECT AND INDIRECT IMPACT

DIRECT..... 4.6 %

INDIRECT....34.0 %

TOTAL..... 38.6 % REDUCTION IN GROSS REVENUES OR

APPROXIMATELY \$4,632,000.00

WE ALSO WILL SEE THE LOSS OF AT LEAST 40 JOBS FROM OUR WORKFORCE



DIRECT NON-ECONOMIC BENEFIT

AS A DIRECT RESULT OF OUR SMALL BUSINESS SUCCESSFULLY WORKING FOR HANSCOM, WE HAVE BENEFITED FROM THE EXPOSURE TO A HIGHER STANDARD OF BUSINESS PRACTICE REQUIRED OF ANY FIRM CONTRACTING WITH THE GOVERNMENT.

BECAUSE OF THE STRINGENT REQUIREMENTS OF OUR GOVERNMENT CONTRACT, OUR BUSINESS HAS BEEN FORCED TO ACHIEVE A LEVEL OF PROFESSIONALISM WHICH HAS DIRECTLY BENEFITED OUR EMPLOYEES, OUR CUSTOMERS, AND THE COMMUNITY AS A WHOLE.

OTHER SMALL BUSINESSES CAN BENEFIT FROM THIS CONTRACTUAL RELATIONSHIP, BUT IF HANSCOM IS CLOSED, THAT OPPORTUNITY WILL CEASE. GOVERNMENT LOANS, PAMPHLETS, ADVICE, ETC. IS NO SUBSTITUTE FOR EXPERIENCE. REAL WORK UNDER REAL CONTRACTUAL REQUIREMENTS BENEFITS THE GOVERNMENT AND BENEFITS SMALL BUSINESS.

# **The Road to the Future: Systems Integration at Hanscom AFB**

**Sanford L. Weiner  
and  
Harvey M. Sapolsky**

**Defense and Arms Control Studies Program**



Center for International Studies  
Massachusetts Institute of Technology  
292 Main Street, Cambridge, Massachusetts 02139

## ***The Road to the Future: Systems Integration at Hanscom AFB***

***Sanford L. Weiner and Harvey M. Sapolsky\****

Hanscom Air Force Base is a unique facility, an air base without aircraft. Hanscom is the home of the Electronic Systems Center, which creates new weapons systems as the Air Force's Global Product Center for Command, Control, Communications, Computer, and Intelligence (C<sup>4</sup>I). The Electronic Systems Center (ESC) does not manufacture new systems, but rather contracts with private firms to build them. Although many of these contractors are nearby in the Boston area, the manufacturing network stretches across the country.

ESC's own critical role in the development process is *concept development and systems integration*, matching technological trends with Air Force mission requirements. To carry out this role ESC has evolved an integrated product team approach that combines the expertise of uniformed officers, Air Force civilians, and contractor scientists and engineers. Within the base, 2,200 uniformed personnel work side-by-side with 2,000 Air Force civilians, and 6,400 contract employees. A key element in the team organization is the partnership ESC has with the MITRE Corporation, which was established as a not-for-profit Federal Research and Development Center to provide systems integration support to the Air Force.

ESC's capabilities are enhanced because it is embedded in the larger high-technology community of the Boston area, and regularly draws on the high-quality science and engineering talent available in a variety of disciplines and companies. From advanced radar design to innovative computer software, ESC's achievements integrate systems by bringing skilled professionals together.

### **ESC's ROLE IN THE NEW ENVIRONMENT**

All the components of the Department of Defense, including the Air Force, are facing a rapidly changing environment for the tasks they must perform and the conditions under which they will perform them. The new environment impacts on ESC's role and the value of its contributions in a number of ways. The broadest influence is the post-Cold War national security environment, which is leading to a downsized budget and force structure for the foreseeable future. This will put the emphasis on lean strategies for carrying out the ongoing missions.



\* *Sanford Weiner is a Research Associate and Harvey Sapolsky is Director, MIT Defense and Arms Control Studies Program, Center for International Studies, Massachusetts Institute of Technology.*

The future battlefield environment is also evolving rapidly. Just as prior military doctrine emphasized the substitution of firepower for manpower, we are now seeing the substitution of smart weapons for mass firepower. However, smart weapons achieve their precision because they are part of a long information chain of command and control. The new weapons put a premium on real time surveillance and target acquisition, and communicating that data directly to the fire control system. This means that maximizing weapons effectiveness now requires the joint integration of formerly separate systems. Optimizing systems individually, which was sufficient in the past, will no longer deliver the performance now desired.

The direct implication of these battlefield trends is that C<sup>4</sup>I is really no longer a logistics or support function, but rather is now on the critical path for the effectiveness of the forces on the battlefield. As the official Air Force Survey of Airpower in the Gulf War put it:



*In World Wars I and II, an air commander could often do little more than send his aircrews off and then pray for their safe return. Now, the aircrews, in concert with systems such as AWACS, ABCCC, and JSTARS can implement a concept of operations developed by senior commanders and consult both with those commanders and with one another while the operation is in progress. The potential this mode of command gives to air units is tremendous. The whole air campaign, including air-to-air engagements and air-to-ground attacks, can be directed from the air itself, and elements of the campaign, such as interdiction, can be modified in real time to suit a changing situation.*

Two other Department of Defense initiatives will also influence the development process. The first of these is the preference for commercial technology, especially in computers, rather than equipment specially designed for military applications. The growing use of this generic technology will again put a premium on ESC's systems integration expertise to fine tune the technology for specific mission needs.

DoD has also emphasized the increasing need for joint development programs and tactical interoperability. ESC's background and experience leaves it well placed to implement this directive as well, since it is the DoD leader in managing joint C<sup>4</sup>I programs such as JSTARS.

\* \* \*

The Hanscom/ESC role in the Air Force future is best symbolized by three roads. Hanscom is located on the original Battle Road from Lexington to Concord, which represents the proud heritage of the American military. The base is also adjacent to Route

128, Massachusetts' famed Technology Highway, with its dense infrastructure of technical expertise. ESC has made effective use of its central position in this complex to design and produce currently deployed systems such as AWACS, which manifests America's technological edge.

The third road is the highway net in Kuwait and Iraq, where Gulf War enemy deployments were brilliantly illuminated by the new JSTARS technology developed by ESC. Still under development, the impressive JSTARS capabilities illustrate the critical role of C<sup>4</sup>I on the battlefield of the future.

## HERITAGE: THE BATTLE ROAD

The battles of Lexington and Concord along the Battle Road mark not only the opening salvo of the American Revolution, but also the key importance of good intelligence from the inception of America's armed forces. The British commander in April 1775 intended a surprise raid from Boston that would capture the Colonial leaders, seize their stores of munitions in Concord, and nip the revolt in the bud (Figure 1).



*Figure 1 - The Battle Road*

However, the colonists gained a precise advance warning of British troop movements and were thus able to counter them effectively. The famous two lamps hanging in the tower of the Old North Church indicated that the British would be cutting directly across Boston Harbor by boat. Paul Revere and William Dawes then carried the warning on horseback inland to Lexington. The patriots effectively mustered the colonial militia and achieved tactical surprise. The intended raid became a British rout, and the message that patriots could stand their ground against professional British soldiers spread throughout the colonies, sparking the revolution.





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## THE PRESENT: ESC ON THE TECHNOLOGY HIGHWAY

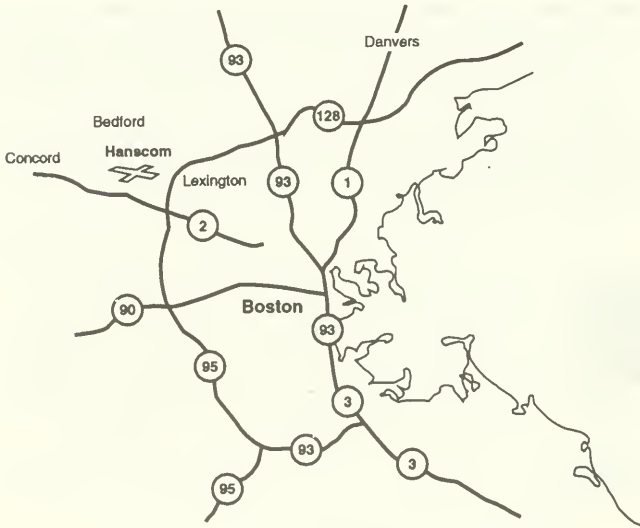
The ingenuity displayed in Lexington in 1775 has its counterpart in the post-World War II partnership between the Air Force and the academic/high-tech infrastructure concentrated in the Boston area. In the immediate postwar era, the center of the partnership was between the Air Force organizations which preceded ESC and MIT's Lincoln Laboratory (which is now collocated at Hanscom). The Air Force/Lincoln team pioneered modern radar technology and the fundamentals of digital computing.

The major product of this collaboration in the 1950s was the first continental air defense system, labeled the Semi-Automatic Ground Environment (SAGE) System. This system was precedent-setting in three separate ways. First, the technology integrated widely dispersed electronic subsystems to a degree never before possible. Second, this technological advance created a new military capability which had not been available before. Third, these efforts required an integrated team approach which was also unusual. All of these characteristics are part of ESC's institutional memory and have been carried into the present. In 1958 the MITRE Corporation was created from Lincoln Laboratory project staff specifically to provide the high level engineering support needed to carry out the system integration for SAGE and similar projects.



Over time the original project teams have expanded to take advantage of all the professional scientific and engineering resources that can be found in the area. ESC/MITRE recruit and train staff drawn not just from MIT and Harvard but also from the broader academic/scientific community including Boston University, Tufts, Northeastern, Boston College, the University of Massachusetts, and other institutions. ESC has major development contracts with Raytheon, Digital Equipment Corporation, GTE, and Textron Defense Systems, and other local high-tech companies. The careful blend of expertise, however, also requires links with dozens of smaller, often unique, engineering and technical firms. They provide support in areas such as configuration management, software development, manufacturing and quality assurance, new electronic sensors and information management.

The important relationships, though, are broader and more far-reaching than just the direct contractual ones. The value added in this network comes from the high quality of the professional talent drawn to solving these challenges. The key for the teams staying at the technological edge is that they are embedded within and constantly interact with the rich high-technology community centered on Route 128, which now numbers over 2,000 firms (Figure 2).



**Figure 2 - Route 128 - America's Technology Highway**

Greater Boston is a world leader in advanced computing, software development, radar imaging, and numerous other relevant technologies. The region contains the nation's greatest concentration of telecommunications firms. Professional staff from academia, small engineering firms, and high-tech companies are constantly cross-fertilizing the new concepts that will become the technological frontier. Some of this activity takes place in specific professional activities such as the local IEEE sessions, but much of it happens in the informal ways that can only occur when a critical mass of professionals is present. Even in the era of the information highway, some interactions still work best on a personal, face to face basis and require a concrete highway.

Two currently deployed Air Force systems, AWACS and JWICS, illustrate the achievements of this network over the last two decades. The Airborne Warning and Control System (AWACS), like SAGE before it, has expanded the range of Air Force capabilities since its initial deployment in 1977. Ground based radar defenses had always had difficulty detecting low flying incoming enemies. Thus the potential for an airborne radar system not subject to these limitations was apparent. The difficulties lay in simultaneously managing several different technologies to create one integrated system that could be carried on a single aircraft.



The needed improvements in radar detection capacity derived from basic research at Lincoln Lab and ESC's Rome Laboratory dating back to the 1950s. However there was considerable skepticism that the technology had advanced far enough to reliably detect aircraft over land against the background clutter. In fact it took several rounds of an



iterative development process involving ESC/MITRE, the prime airframe contractor, and the prime radar contractor, before the desired performance was achieved. The second key ESC/MITRE role was to match the radar developments with new air to ground high speed communications links, and new computing capabilities. The system required newly developed hardware/software that could perform both signal detection analysis, and data management and display functions.

The integration of these disparate technologies produced an unprecedented advance in the ability to detect potential targets and display them for U.S. forces. AWACS as currently deployed can track over 300 aircraft over land or water at any one time, up to 250 miles away. In addition it can communicate target locations directly to the appropriate fighter aircraft. AWACS is now a worldwide symbol of technological superiority — where once a carrier would have been automatically sent to a crisis area to indicate U.S. resolve, we now often send AWACS instead.

ESC has also been responsible for the Joint Worldwide Intelligence and Communications System (JWICS). This system provides for secure, worldwide video conference capabilities for real time command and control. CONUS commanders can now interact directly with the field commanders, and get a direct video feed from the battlefield. Such capability is also of great utility in uncertain peacekeeping environments, and has been employed in both Somalia and Haiti.

## JSTARS AND THE FUTURE ELECTRONIC BATTLEFIELD

The Gulf War took place in 1991, when the Joint Surveillance Target Attack Radar System (JSTARS) was still under development. Yet the two JSTARS prototypes rushed into service for Desert Storm made a dramatic impact on our surveillance of enemy ground positions. The Gulf War thus provided a vivid preview of the new capabilities made possible by ESC's team approach. JSTARS is an excellent illustration of both the *process* of systems integration that creates these new weapons, and their potential for *reshaping* the battlefield.

### JSTAR Systems Integration

The first task for military-oriented systems development is monitoring the evolving conceptions of potential significant missions among the user commands. In the mid-1970s the Defense Science Board sponsored a series of "Assault Breaker" studies that analyzed alternative ways to counter a Warsaw Pact offensive in Central Europe. The studies highlighted the potential of being able to attack enemy tank concentrations fifty to one hundred miles behind the front line, before they could join the actual battle. If accurate reconnaissance could be performed at these distances, then major impact on the subsequent battle might be achieved.

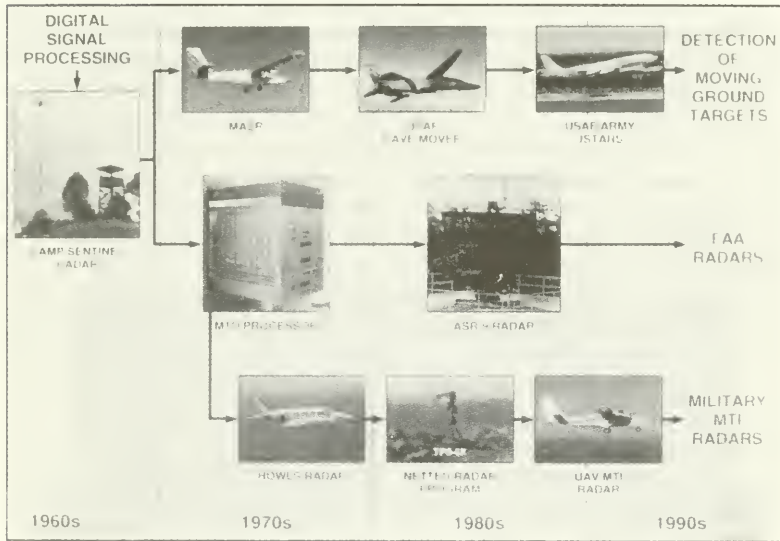
The success of AWACS had made the concept of mobile, far-ranging, early warning radar desirable. The question again was whether further advances in technology had been achieved that could be matched against this potential new mission. Detecting slow moving tanks or trucks on the ground was far more demanding than seeing fast moving aircraft above it. The background clutter problem in particular was much more severe. The overall detection sensitivity had to be tenfold better than the AWACS standard to make the new system viable.

Both Lincoln Laboratory and the Rome Laboratory had continued their work on advanced radar technology. Their successes made the new system conceivable but with considerable remaining uncertainties. Some of these were resolved by the PAVE MOVER experiments where a prototype radar mounted on an F-111 imaged ground objects and communicated the data to a ground command (Figure 3).

From about 1980, ESC took on the task of defining a joint integrated system for both the Air Force and Army users. (In fact the original conception involved - using airborne warning to impact the ground battle - was a joint idea in its essence.) The basic task was envisioning the various possible components as an integrated system and defining an accuracy for the overall system.



The effective accuracy for any weapon system depends on the combined result of the errors introduced by each system component. Thus, a moving platform will have some error in knowing its own position at any one time. (Satellite navigation systems will be reducing this error for both AWACS and JSTARS.) The radar will also have errors in its location of a particular target. The system must then predict where moving targets will be several minutes later when a weapon could intercept them. Finally the weapon itself will have an associated error in hitting the target.



**Figure 3 - Evolution of MTI Radars for Detection of Moving Targets**

The combined errors produced a net estimate of precision for the entire system; i.e., the probability that sighting a particular target would result in the target being killed. Within this framework systems engineering was devoted to analyzing the cost effectiveness of reducing the error in any one component, compared with other components. The goal was to find out where further development would have the most impact on overall accuracy. MITRE, for example, arranged extensive field tests of trucks with different radar signatures moving across a variety of terrains, to get better empirical estimates of the radar detection problem.

The next broad systems consideration was to analyze the variety of scenarios and platforms that might carry these advanced radars. The analysts began with one of the most demanding scenarios, where Air Force aircraft would detect a tank column, send the signal to an Army surface-to-surface missile and provide direct fire control for the missile. Consideration was also given to flying the radars on Army helicopters or fixed wing aircraft and numerous other Air Force platforms. In 1984 the final joint service agreement for JSTARS provided for an Air Force managed, modified Boeing 707 to provide target information to a ground station for forwarding to fighter/bombers and ground commanders.



Feedback from the AWACS deployments suggested that the ground stations for that program were too demanding of the local logistical support in some parts of the world. An ESC team thus redefined the JSTARS parameters once more, to move all the computing and analysis capabilities onto the aircraft itself, thus allowing for a simple, highly mobile ground station.

Local components of the ESC team continued to play an active role after Grumman began the formal development process in 1985. One of the original software contractors, for example, was a local high-tech start-up company located a few miles from the base. Analytical Systems Engineering, in Burlington, reviewed and evaluated the contractors' design studies in comparison to the program goals. MEI Technology and Systems Resources Corp. provided engineering support for configuration management. Dynamics Research Corp., in Wilmington, designed another key component of the operating software. Each of these small engineering firms expanded the capabilities of the Joint STARS program office to manage the fast growth development.

MITRE also played a key role in the design of the development process. Grumman had originally planned a series of discrete, parallel efforts that would have left the system unusable until all the work was totally completed. MITRE successfully pressed for an iterative process where the whole system could function first at fifty to sixty percent of design goals, and then be successively upgraded. This change proved crucial when the development process was interrupted so that the two prototypes could fly to the Persian Gulf.



#### JSTARS In Combat

*In Desert Storm, JSTARS stole the show. Anyone who has seen the JSTARS moving target indicator radar displays, for example, of the Iraqi retreat from Kuwait City, will know why. Indeed, the screen images can be saved, combined, and then run sequentially, and the effect is magical. The enemy's forces deploy, scatter, and then regroup right in front of the viewer's eyes. JSTARS is visual; it shows you where your enemy is and what he's doing now. It should not surprise anyone that JSTARS was in great demand during Desert Storm.*

This quotation from the Gulf War Airpower Review testifies to the remarkable impact on the operating forces when an entirely new capability is available for the first time. In fact the two JSTARS prototypes rushed to the battlefield were demonstrating only the basic system capabilities: the development process was several years from completion. Each of the prototypes flew eleven-hour missions on alternate days. In between the team of ESC and contractor engineers implemented on-the-spot technical fixes, particularly in the computer software.

The two JSTARS E-8s were deployed to Saudi Arabia on 12 January 1991 and went into operation on 14 January, along with five Army ground stations. They played an important role in repulsing the Iraqi surprise attack on Khafji which began on 29 January. On that day JSTARS detected a convoy moving south from Kuwait City (Figure 4). It passed the target to the Airborne Battlefield Command and Control Center which called in coalition aircraft. The coalition forces reportedly destroyed 58 of the 61 vehicles in the convoy. Later that day JSTARS surveillance showed that the Iraqi forces in the Khafji incursion were not yet being provided with major reinforcements. This information clarified the tactical situation and greatly assisted the ground commanders in planning their counterattack.



*Figure 4 - JSTARS Image of Iraqi Units Approaching Khafji, 29 January 1991*

The next day, 30 January 1991, JSTARS and other reconnaissance aircraft detected two Iraqi divisions marshalling for a follow-on attack. Their intention seems to have been to trap and then cut off the coalition forces. Instead with the early warning, coalition airpower systematically attacked and decimated the divisions throughout the night; by daybreak the Iraqis were retreating in disarray. B-52s, F-15s, F-16s, F-18s, and A-10s all participated in this effort. This example powerfully vindicated the original mission concept of the "Assault Breaker" studies from the 1970s: to head off enemy reinforcements before they could enter the ground engagement. Postwar analyses have stressed the importance of the Khafji fighting on Iraqi strategic planning. Having discovered that divisions on the move would be destroyed from the air, the Iraqis never again took the offensive.

Finally, during the fast moving ground war in February, JSTARS again proved remarkably effective in charting "the mother of all retreats" (Figure 5). Overall in 535 flying



**Figure 5 - JSTARS Image of Iraqi Retreat 28 February 1991**

hours JSTARS located 1,000 important targets and controlled over 750 attack sorties. The only problem that developed was that the prototypes became too popular among the ground commanders. There was not enough capacity to meet all the requests. As the JSTARS commander recalled "every night we'd get into a battle . . . the VII Corps wanted to run it his way, and MARCENT wanted to run it their way".

#### **JSTARS Final Development**

The initial six JSTARS aircraft are expected to undergo final field testing and then deployment in the near future. The first contract was for a total of 20 aircraft, but recent comments from OSD suggest that the high value placed on the system will lead to a full deployment of 40 or more planes. The U.S. has just recommended to NATO that it should also buy 12 planes for its forces.

Even during development the JSTARS computer systems were being upgraded to take advantage of rapidly moving commercial technology. Digital supplied new hardware developed around its world-class Alpha processing chip. Raytheon customized the



hardware for military aviation use. MITRE oversaw the integration of the new computers with the other subsystems. This is an excellent example of how the Boston technical infrastructure speeds the use of advanced civilian technology for dual use applications.

#### **CONCLUSION: ESC AND THE FUTURE OF C<sup>4</sup>I**

JSTARS represents only one element in the battlefield of the future. In addition to deploying and upgrading current platforms, ESC is working on new advanced computing and information systems. Its largest challenge, though, will be to integrate these new systems into a broader network, where each system supports the others. Here cross-service interoperability will be of greatest importance.

Integrating new technology into existing programs and platforms has become a growing ESC role. For example, ESC is managing the complete revision of the command and control systems for NORAD at the Cheyenne Mountain command center. In addition, a major upgrade of the AWACS radar systems that will allow detection of targets with smaller cross-sections, such as cruise missiles, is under way.

But the ESC/MITRE technology groups are already looking further down the road. Aircraft-qualified, miniaturized supercomputers will soon be available. For both AWACS and JSTARS, a few supercomputers could replace the banks of specialized machines now

necessary. The extraordinary processing power would be another leap in flexibility. Yet with the considerable investment already in place, MITRE is carefully evaluating what the most cost-effective transition path would look like: integration from the present into the future.

The Gulf War revealed that new computerized capabilities did not interface well with functions that were still being carried out manually. Generating timely Air Tasking Orders for over 2,000 sorties/day was particularly difficult, and ESC is now working on a system to both automate this process, and integrate it with other related functions.

The war also underscored the need for more secure theatre-deployable communications systems, particularly those that are interoperable. This is one of about 15 current programs (Table 1) where ESC is the lead manager for joint developments. In fact ESC is more engaged in joint programs than any of the other equivalent service organizations. The Air Force in Fiscal Year 1995 will manage 52% of the total DoD C<sup>3</sup> budget, compared with 39% for the Army and Navy combined.



**Table 1 – ESC Joint Programs**

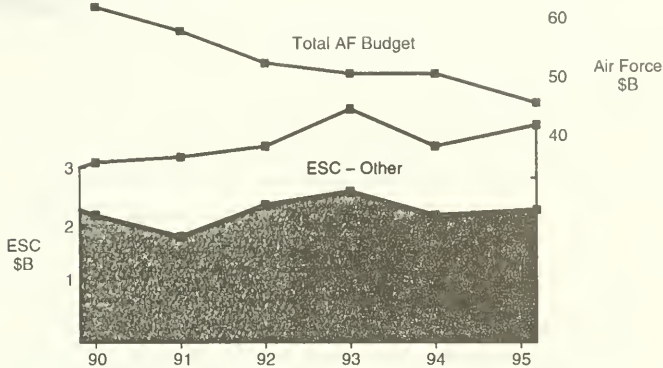
Program	\$M
Joint Services Imagery Processing System	278
Intelligence Data Handling Systems	375
Sentinel Training Systems	27
Joint Analysis Center	70
MATT Radio	104
Joint STARS	4,770
JTIDS	696
Milstar Terminals	423
DoD National Airspace System	353
Microwave/Precision Landing System	46
Tactical Secure Data Communication	177
Mission Support System	293
Joint Worldwide Intelligence Communication System	100
Joint Deployable Intelligence System	50
Ballistic Missile Defense C <sup>3</sup>	50
FA Radar	300
Total Value	8,100



The essence of ESC's work, then, is integration. First matching parallel technologies with future mission requirements, then integrating technical subsystems into new weapons platforms. Now the work increasingly involves linking across platforms and services, to achieve effective theatre battle management. Yet the larger the technical system that needs to be integrated, the more it depends on the varied skills of the integrated professional team, which must see the whole picture from its central position.



The demand for C<sup>4</sup>I integrators continues to be strong. ESC's Air Force contracts have continued at an even pace, despite the budget tightening. Joint programs and foreign military sales have increased significantly, to over \$1 billion/year, the closest thing there is to a market test of customer interest (Figure 6).



**Figure 6 - Impact of Joint Programs on Budget - ESC vs Air Force**

Because most of ESC's costs are related to staff, not infrastructure, relocating the same efforts somewhere else would save little money. But the true costs and loss of capability might be unacceptably high. Even if the whole ESC/MITRE partnership moved en masse, there would still be expensive disruptions of all the ongoing development work.

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Moreover, building a new team from a different technical base could be a long and difficult task. ESC now depends on local contractors for 85% of its inhouse engineering support. Many of these would not be willing to move, or able to get their staff to move with them.

The current ESC integrated network, by contrast, has evolved over thirty years, and has proved its effectiveness. The Duke of Wellington once said, "I've spent most of my career wondering what was on the other side of the hill". With AWACS and JSTARS, ESC has changed the commander's vision of the battlefield forever. We now are beginning to know what is over the other side of the hill. The Hanscom team left in place can continue to improve this vital warfighting capability.





The Defense and Arms Control Studies (DACS) Program is a graduate-level, research and training program based at the MIT Center for International Studies. It traces its origins to two initiatives. One is the teaching on international security topics that Professor William Kaufmann began in the 1960s in the MIT Political Science Department. The other is the MIT-wide seminars on nuclear weapons and arms control policy that Professor Jack Ruina and Professor George Rathjens created in the mid 1970s.

The Program's teaching ties are primarily but not exclusively with the Political Science Department at MIT. The DACS faculty, however, includes natural scientists and engineers as well as social scientists. Of particular pride to the Program is its ability to integrate technical and political analyses in studies of international security issues.

Several of the DACS faculty members have had extensive government experience. They and the other Program faculty advise or comment frequently on current policy problems. But the Program's prime task is educating those young men and women who will be the next generation of scholars and practitioners in international security policy making. The Program's research and public service activities necessarily complement that effort.

The Center for International Studies is a major unit of the School of Humanities and Social Sciences at MIT and seeks to encourage the analysis of issues of continuing public concern. Key components of the Center in addition to DACS are Seminar XXI, which offers training in the analysis of international issues for senior military officers, government officials, and industry executives; and the MIT Japan Program, which conducts research and educational activities to further knowledge about Japanese technology, economic activities, and politics.

#### **Defense and Arms Control Studies Program**

**Massachusetts Institute of Technology**

292 Main Street (E38-603)

Cambridge, Massachusetts 02139

(617) 253-8075

Gov. William F. Weld  
Testimony on Hanscom Air Force Base  
House Small Business Subcommittee on Government Programs  
Monday, February 13, 1995

HOUSE SMALL BUSINESS SUBCOMMITTEE ON  
GOVERNMENT PROGRAMS  
HANSCOM AIR FORCE BASE TESTIMONY

MONDAY, FEBRUARY 13, 1995

GOOD MORNING, MR. CHAIRMAN. ON BEHALF OF THE ENTIRE COMMONWEALTH, WHICH YOU REPRESENT SO ABLY ALONG WITH CONGRESSMAN MEEHAN AND KENNEDY IN WASHINGTON, I WANT TO THANK YOU FOR HOLDING THIS HEARING HERE TODAY.

I'D LIKE TO TAKE THIS OPPORTUNITY TO DISCUSS BRIEFLY THE IMPORTANCE OF HANSCOM AIR FORCE BASE TO THE COUNTRY, BOTH FROM A MILITARY POINT OF VIEW, AND MORE TO THE POINT FOR TODAY'S HEARING, FROM A HIGH TECH AND SMALL BUSINESS/JOBS POINT OF VIEW.

ALMOST ANY MILITARY HISTORIAN WILL TELL YOU THAT TECHNOLOGY HAS TRADITIONALLY PLAYED A CRITICAL ROLE IN ARMED CONFLICT. THIS HAS BEEN TRUE FROM CROSSBOWS TO COMPUTER-GUIDED MISSILES.

AND THE FUTURE SUCCESS OF OUR COMBAT FORCES IN DETERRING OR DEFEATING ADVERSARIES WILL DEPEND INCREASINGLY ON TECHNOLOGY. MORE SPECIFICALLY, WHOEVER CAN GATHER INFORMATION MOST QUICKLY AND COMMUNICATE THAT INFORMATION TO FORCES IN THE FIELD WILL WIN FUTURE WARS. THE PAST EMPHASIS ON MASS FIREPOWER OR NUMERICAL ADVANTAGE IS GIVING WAY TO INFORMATION MANAGEMENT, PRECISION BOMBING, AND ELECTRONIC COUNTERMEASURES.

AND WHEN IT COMES TO TECHNOLOGY, HANSCOM IS A NATIONAL

LEADER. DURING THE GULF WAR, THE SYSTEMS DEVELOPED AT HANSCOM, SUCH AS J-STARS AND AWACS, PROVED DECISIVE IN THE SWIFT VICTORY OF THE COALITION FORCES.

WHILE EVERY STATE WILL LAUNCH "SAVE THE BASE" CAMPAIGNS, THE GROUNDSWELL OF SUPPORT FOR HANSCOM HERE IN MASSACHUSETTS IS CHIEFLY INSPIRED BY THE RECOGNITION THAT AMERICAN LIVES ARE IN THE BALANCE AS THE PENTAGON DECIDES WHERE TO ACQUIRE ITS TECHNOLOGY. WE THINK HANSCOM IS AN OBVIOUS SOURCE TO RETAIN AND EVEN EXPAND.

THAT BRINGS ME TO THE SECOND POINT. AS MANY OF YOU WELL KNOW, THE ROUTE 128 AREA IS A GLOBAL CENTER FOR LEADING-EDGE TECHNOLOGIES AND HIGHLY EDUCATED WORKERS, AND IS ESPECIALLY POTENT IN THE TECHNOLOGIES CRITICAL TO PRODUCING WORLD-CLASS C4I. BESIDES BEING THE EAST COAST HEADQUARTERS FOR TELECOMMUNICATIONS AND SOFTWARE, WE ALSO HAVE SYSTEMS INTEGRATION AND ENGINEERING FIRMS TO WHOM HANSCOM OUTSOURCES 80 PERCENT OF ITS ENGINEERING SUPPORT.

PRESIDENT CLINTON AND HIS ADMINISTRATION HAVE TALKED FREQUENTLY ABOUT IMPROVING THE COUNTRY'S TECHNOLOGY BASE. IN FACT, THEY HAVE LAUNCHED A TECHNOLOGY REINVESTMENT PROGRAM TO ENHANCE "REGIONAL INDUSTRIAL CAPABILITIES THAT ARE IMPORTANT TO NATIONAL DEFENSE."

I WOULD SUGGEST THAT THE FIRMS AROUND HANSCOM ALREADY COMPRISE THE COUNTRY'S STRONGEST REGIONAL TECHNOLOGY ALLIANCE.

SECRETARY PERRY, HIMSELF, HAS TALKED ABOUT THE FACT THAT OUR "TECHNOLOGICAL EDGE TODAY IN DEFENSE COMES FROM OUR COMMERCIAL TECHNOLOGY BASE."

HANSCOM IS FIRMLY INTEGRATED INTO MASSACHUSETTS' TECHNOLOGICAL AND ENTREPRENEURIAL FABRIC. WE BELIEVE RELOCATING THE AIR FORCE'S HANSCOM FACILITIES WOULD BE A COSTLY MISTAKE -- IT WOULD DISRUPT AND WEAKEN THE QUALITY OF THE AIR FORCES C4I SYSTEMS; IT WOULD FORCE THE AIR FORCE TO SPEND PRECIOUS TIME AND MONEY RECONSTRUCTING THE TECHNICAL BASE THAT ALREADY EXISTS HERE; AND IT WOULD CERTAINLY BE HARMFUL TO THE COMMERCIAL HIGH TECH CLUSTER THAT HAS DEVELOPED SO SUCCESSFULLY IN THIS AREA.

THE WORK DONE AT HANSCOM "STOLE THE SHOW" AND SAVED LIVES IN DESERT STORM.

SMALL BUSINESSES IN THIS AREA ARE NOW WORKING WITH HANSCOM ON ENGINEERING SERVICES, ON INTELLIGENCE SYSTEMS, ON PHYSICAL SECURITY SYSTEMS, AND ON ADVANCED R-AND-D WITH BROAD MILITARY APPLICATIONS.

IN ADDITION, THERE ARE COMPANIES HERE THAT DEPEND ON HANSCOM, AND UPON WHOM HANSCOM DEPENDS, FOR CONSTRUCTION WORK AND FOR BASE MAINTENANCE SERVICES; AND FOR TRAVEL SERVICES.

THESE COMPANIES INCLUDE INFOTECH DEVELOPMENT, MEI TECHNOLOGY, SENCOM CORPORATION, ASSURANCE TECHNOLOGY, HORIZONS TECHNOLOGY, SYSTEMS RESOURCES CORPORATION, ANALYTICAL SYSTEMS ENGINEERING CORPORATION, ABACUS TECHNOLOGY, B-T-G, AND SUPPORT



SYSTEMS ASSOCIATES. THESE COMPANIES ALL HAVE ACQUIRED MILLIONS OF DOLLARS WORTH OF EXPERTISE THAT CANNOT BE FOUND ELSEWHERE.

I'VE SEEN FIGURES THAT INDICATE HANSCOM HAS SOME \$1.2 BILLION IN "BASE LEVEL" EXPENDITURES, WITH \$3.2 BILLION IN TOTAL ECONOMIC IMPACT TO THE NEW ENGLAND ECONOMY.

THERE ARE OVER 17,000 OFF-BASE, PRIVATE-SECTOR JOBS THAT DEPEND ON HANSCOM, AND MANY OF THESE JOBS ARE HIGH-SKILL, HIGH-TECH POSITIONS THAT DEVELOP ONE-OF-A-KIND TECHNOLOGY. YOU WON'T FIND WORKERS WITH THAT EXPERTISE IN OTHER PARTS OF THE COUNTRY.

TO ILLUSTRATE THE DEPTH OF THE COMMONWEALTH'S COMMITMENT TO KEEPING HANSCOM UP AND RUNNING, LAST WEEK I SIGNED A \$100 MILLION BOND BILL THAT WILL FUND CAPITAL IMPROVEMENTS AT MASSACHUSETTS MILITARY INSTALLATIONS.

IN OTHER WORDS, IF THIS BASE STAYS OPEN, AS WE BELIEVE IT SHOULD, WE'RE PREPARED TO OFFER A REAL SUGAR INJECTION TO HELP IT FURTHER EXPAND ITS MISSION, AND ITS EFFECTIVENESS.

I THANK YOU FOR THIS HEARING. LT. GOVERNOR CELLUCCI AND I ARE PREPARED TO WORK WITH EVERY MEMBER OF THE MASSACHUSETTS CONGRESSIONAL DELEGATION, AND THE ENTIRE PENTAGON, TO KEEP THIS VITAL BASE OPERATING AND IN FIGHTING SHAPE. I'LL ALSO NOTE FOR THE RECORD THAT THE LT. GOVERNOR IS MEETING THIS MORNING WITH ASSISTANT SECRETARY GOTBAUM AT NATICK LABS TO DISCUSS THE FUTURE OF THAT BASE, AS WELL. WE BELIEVE BOTH CONTRIBUTE STRONGLY TO MASSACHUSETTS AND TO OUR COUNTRY.

THANK YOU.

## THE COMMONWEALTH OF MASSACHUSETTS

*In the Year One Thousand Nine Hundred and Ninety-five*

AN ACT RELATIVE TO STIMULATING EMPLOYMENT AND ENCOURAGING THE SITING OF CERTAIN FEDERAL FACILITIES IN THE COMMONWEALTH.

*Whereas*, The deferred operation of this act would tend to defeat its purpose, which is to immediately encourage the siting of certain federal facilities in the commonwealth, therefore it is hereby declared to be an emergency law, necessary for the immediate preservation of the public convenience. \_\_\_\_\_

*Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:*

SECTION 1. Clause (4) of section 1 of chapter 300 of the acts of 1992 is hereby amended by inserting after the word "activity", in line 5, the following words:- ; the preservation and enhancement of the commonwealth's high-tech economic base.

SECTION 2. Said chapter 300 is hereby further amended by striking out section 1A, as appearing in section 1 of chapter 386 of the acts of 1992, and inserting in place thereof the following section:-

*Section 1A.* To provide for the projects and expenditures provided for in this act, the secretary of administration and finance is hereby authorized to spend the sum set forth in section two for the several purposes of this act, subject to the conditions specified herein and subject to the provisions of law regulating the disbursement of public funds and the approval thereof.

SECTION 3. Item 1599-8000 of section 2 of said chapter 300 is hereby amended by inserting after the word "Southbridge", in line 3, the following words:- or for capital projects to enhance or expand other United States Department of Defense facilities in the commonwealth.

SECTION 4. Said item 1599-8000 of said section 2 of said chapter 300 is hereby further amended by inserting after the word "requirements", in line 7, the following words:- , or other Department of Defense requirements.

SECTION 5. Said item 1599-8000 of said section 2 of said chapter 300 is hereby further amended by inserting after the word "Southbridge", in line 16,

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the following words:- or enhance or expand other Department of Defense facilities in the commonwealth.

SECTION 6. Section 3 of said chapter 300 is hereby amended by inserting after the word "Southbridge", in line 6, the following words:- , or any United States Department of Defense facilities in the commonwealth selected for enhancement or expansion as the result of the nineteen hundred and ninety-five base closure and realignment process.

SECTION 7. Said section 3 of said chapter 300 is hereby further amended by inserting after the word "chosen", in line 8, the following words:- including any land or buildings, or interest therein, necessary to carry out the purposes of this act.

SECTION 8. Section 4 of said chapter 300 is hereby amended by inserting after the word "facilities", in line 4, the following words:- or upon notification by the United States Department of Defense to the base commander or facility administrator of a Department of Defense facility that the facility has been selected for enhancement or expansion as the result of the nineteen hundred and ninety-five base closure and realignment process.

SECTION 9. Said section 4 of said chapter 300 is hereby further amended by inserting after the word "requirements", in line 11, the following words:- or other United States Department of Defense requirements.

SECTION 10. Said section 4 of said chapter 300 is hereby further amended by inserting after the word "Services", in line 23, the following words:- or other United States Department of Defense requirements.

SECTION 11. Section 5 of said chapter 300 is hereby amended by inserting after the word "facilities", in line 7, the following words:- or prior to the notification by the United States Department of Defense that facilities in the commonwealth have been selected for enhancement or expansion.

SECTION 12. Section 6 of said chapter 300 is hereby amended by inserting after the word "Government", in line 4, the following words:- , or to any United States Department of Defense contractor performing work for a Department of Defense facility.

SECTION 13. Section 7 of said chapter 300 is hereby amended by inserting after the word "Services", in line 6, the following words:- , the Department of Defense facilities that have been selected for enhancement or expansion, or a Department of Defense contractor performing work for a Department of Defense facility that has been selected for enhancement or expansion.

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SECTION 14. Said chapter 300 is hereby further amended by striking out sections 8A and 8B, inserted by section 2 of chapter 386 of the acts of 1992, and inserting in place thereof the following two sections:-

Section 8A. To meet the expenditures necessary in carrying out the provisions of this act, the state treasurer shall, upon the request of the governor, issue and sell bonds of the commonwealth, in an amount to be specified by the governor from time to time, but not exceeding, in the aggregate, the sum of one hundred million dollars. Said bonds shall only be issued and sold after final approval by the United States Congress of the recommendation of the Department of Defense to locate said Finance and Accounting Services Facility in the town of Southbridge or after final approval by the United States Congress of a recommendation from the United States Defense Base Closure and Realignment Commission to enhance or expand other United States Department of Defense facilities in the commonwealth. All bonds issued by the commonwealth, as aforesaid, shall be designated on their face, Federal Facilities Enhancement Act of 1995, and shall be issued for such maximum term of years, not exceeding thirty years, as the governor may recommend to the general court pursuant to Section 3 of Article LXII of the Amendments to the Constitution of the Commonwealth; provided, however, that all such bonds shall be payable not later than December thirty-first, two thousand and thirty. Notwithstanding any other provision of this act, bonds, and the interest thereon, issued under the authority of this section shall be general obligations of the commonwealth.

Section 8B. The state treasurer may borrow from time to time on the credit of the commonwealth such sums of money as may be necessary for the purposes of meeting payments as authorized by this act and may issue and renew from time to time notes of the commonwealth therefor, bearing interest payable at such time and at such rates as shall be fixed by the state treasurer. Such notes shall be issued and may be renewed one or more times for such term, not exceeding one year, as the governor may recommend to the general court in accordance with Section 3 of Article LXII of the Amendments to the Constitution of the Commonwealth, but the final maturities of such notes, whether original or renewal, shall not be later than June thirtieth, two thousand and seven. Notwithstanding any other provision of this act, notes and interest thereon issued under the authority of this act shall be general obligations of the commonwealth.

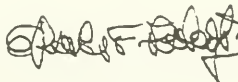
SECTION 15. Section 9 of said chapter 300 is hereby amended by inserting after the word "Southbridge", in line 3, the following words:- or to enhance or expand other United States Department of Defense facilities in the commonwealth.

SECTION 16. Said section 9 of said chapter 300 is hereby further amended by striking out, in line 4, the word "ninety-four" and inserting in place thereof the following word:- ninety-six.

SECTION 17. Nothing in this act shall be construed to preclude the town of Southbridge from accessing funds from the proceeds of any bonds issued pursuant to this act.

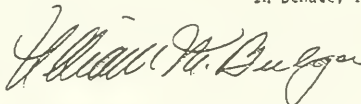
House of Representatives, February 9, 1995.

Preamble adopted,

 Speaker.


In Senate, February 9, 1995.

Preamble adopted,

 , President.


House of Representatives, February 9, 1995.

Bill passed to be enacted,

 Acting Speaker.

In Senate, February 9, 1995.

Bill passed to be enacted,

 Acting President.

9 February, 1995.

Approved,

at five o'clock and 35 minutes, P. M.

  
Governor.

BARNEY FRANK  
15TH DISTRICT, MASSACHUSETTS

2404 RAYBURN BUILDING  
WASHINGTON, DC 20515-2104  
(202) 225-5931

29 CAPT'S STREET  
NEWTON, MA 02458  
(617) 332-3920

Congress of the United States  
House of Representatives  
Washington, DC

558 PLEASANT STREET  
ROOM 309  
NEW BEDFORD, MA 02740  
(508) 898-6462

222 MILLIKEN PLACE  
THIRD FLOOR  
FALL RIVER, MA 02721  
(508) 674-3551

89 MAIN STREET  
BRIDGEWATER, MA 02324  
(508) 687-9403

STATEMENT OF HON. BARNEY FRANK

SMALL BUSINESS SUBCOMMITTEE ON GOVERNMENT PROGRAMS

FEBRUARY 13, 1995

Mr. Chairman, I would like to commend you for scheduling this important hearing today on the small business impact of Hanscom Air Force Base. I regret that previous commitments in Washington make it impossible for me to join you today, and I appreciate this opportunity to submit a written statement expressing my belief that Hanscom must be allowed to continue its key role, not only in improving the ability of our military personnel to defend themselves and, indeed, all of us, but also in strengthening the economy -- and in particular, the economic climate for small businesses -- in the region.

I am sure that the participants in today's hearing are familiar with the truly incredible array of technological innovations with which Hanscom has been associated, but I would like to mention a few of them, simply to illustrate that Hanscom is a genuine world class research facility and sponsor of private sector research. These advances include the use of lasers for medical procedures like heart bypass operations and blood clot removal; mammography; AWACS, radar, other technologically advanced military communication equipment; commercial air traffic control systems; and optics research. These and countless other achievements have improved the ability of our Armed Forces to defend America and enriched our lives on many levels.

While Hanscom itself has more than 10,000 employees and contracts with some large corporations in the area, it also works closely with numerous smaller businesses in the area. As you know, Mr. Chairman, current estimates are that nearly 20,000 off-base jobs with a \$2 billion economic impact are directly attributable to Hanscom, with thousands of these jobs and millions of the dollars going to smaller businesses. In addition, there is a broad ripple effect throughout the region, as the employees of Hanscom proper and those who work at the corporations with which the base contracts out patronize small businesses of all kinds as they go about their lives.

Decisions about whether to preserve military bases under the Base Realignment and Closure program should not be made solely on the basis of economic impact in the affected area. But, where a



given base continues to play a crucial role in our national defense which cannot practicably be duplicated elsewhere in a reasonable amount of time, if at all (something which is clearly true in the case of Hanscom, because of its proximity to so many small high technology firms and respected research universities), and makes positive contributions to the regional economy that go far beyond the mere jobs on base, I believe that it is reasonable to take into account the economic impact of closure.

Mr. Chairman, I believe it is very clear that closing down Hanscom Air Force Base would have a serious negative impact on the climate for small business growth and development in the region. This would be the wrong thing to do at a time when the Commonwealth is still in the process of extricating itself from the effects of the recent recession, and I join you in recommending in the strongest possible voice that Hanscom be preserved.



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